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AMERICAN TRADE AND THE WAR

Vol. XXXV

NOVEMBER, 1939

No. 11

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FAR EASTERN CROSS-CURRENTS

President Roosevelt, in an Armistice Day speech, declared he was seeking a road to peace which would be better than that achieved in 1918. Shortly after placing a wreath on the Tomb of the Unknown Soldier at Arlington Cemetery, the President briefly addressed the centennial ceremonies at the Virginia Military Institute at Lexington by telephone.

"There is nothing inconsistent in saying a word about peace at the anniversary of a great school of arms," he said. "In our history, the two have always had some connection. We never had the illusion that peace and freedom could be based on weakness. Now we need a new and better peace; peace which will cause men at length to lay down the weapons of hatred which have been used to divide them and to forego their purposeless ambitions which have always created fear—ambitions which, in the long run, serve no useful end.

"We seek a language in which neighbor can talk to neighbor; in which men can talk to men; in which common, homely, human instincts, which are found in every man, may reach expression through the elimination of fear.

"I have sought and still seek in all simplicity to try to find a road toward this peace. It must be the goal, not only of men trained to arms, but of all of us everywhere whose dearest desire is quiet peace under liberty."

* * * * *

Reporting reaction in Moscow to Foreign Commissar V. M. Molotov's address before the Supreme Soviet of the Union of Soviet Socialist Republics on October 31, the *Times*' Moscow correspondent states in a newspaper dispatch.

"Apart from his references to the Finnish-Soviet talks, diplomatic circles in Moscow lay the most importance to Mr. Molotov's statement about an improvement in the relations between the Soviet Union and Japan and his complete omission of any references to China. Inference is drawn in these circles that, provided Japan is willing to clarify her relations with the Soviet Union, the Soviet Government will disinterest itself in China."

The *Times* says, in view of these indications, that belief is growing in London that the Soviets are concentrating their attention on the Baltic and have decided to wash their hands of the Sino-Japanese conflict.

The *Manchester Guardian*, in an editorial declared that the Chungking Government, headed by General Chiang Kai-shek, must have been "profoundly disturbed" by the nature of the Soviet Foreign Commissar, Mr. Viacheslav M. Molotov's address.

The journal pointed out that although Japan was rebuked for endeavoring to appropriate part of Outer-Mongolia, the speech failed to attack Japan's actions in China Proper, while no direct or indirect mention was made of China's position.

Hinting the possibility of a general Soviet-Japanese agreement, the article declared that it isn't easy to imagine how the Soviet Union and Japan could really come to an agreement at the expense of China, when both are interested chiefly in North China and Mongolia.

Japan is still bitterly opposed to Communism in China. There is a possibility, however, the journal stated that Soviet Russia might agree "to disinterest itself" in China for guaranteeing peace on its Eastern frontier and for improving economic relations.

The article concluded by emphasizing that such an agreement is keenly desired by the German Government.

The January session of the United States Congress will authorize economic pressure against Japan to halt alleged anti-American actions in Japanese-occupied areas of China, it was predicted by Senator Key Pittman, chairman of the Senate Foreign Relations Committee.

The Nevada Democrat said he himself would press Congress for a resolution empowering President Roosevelt to declare an embargo against shipment of vital war supplies and raw materials to Japan soon after the abrogated Japanese-American trade treaty of 1911 expires on January 26.

Senator Pittman, who led the Administration to victory with his new neutrality bill, said he seriously doubted that it would be possible for Japan and the United States to reach an understanding for a new trade treaty under present conditions in the Far East.

"The mere adoption of my resolution against Japan," Senator Pittman said, "would be bound to have a salutary effect on Japanese-American relations." He said such a resolution would be a good weapon in the hands of the Administration even if it was never used.

"I think such a resolution would be favored by the Senate Foreign Relations Committee," he said, "and will probably be reported to Congress as soon as the treaty of amity with Japan expires on January 26. I think there will be no serious opposition in Congress."

Senator Pittman pointed out that at present Japan can and does ignore American protests against restrictions on American business in China because she knows "we have nothing to back them up."

He said he would not ask for approval of his resolution until the Japanese-American trade treaty expires because "it would not be well of us to accuse Japan of breaking the Nine Power Treaty if we acted contrary to a treaty we now have with the Japanese."

* * * * *

A Japanese has been given a special concession by the Ecuadorean Government for the growing of cinchona trees and the manufacture and export of quinine for a period of 50 years, according to the *Asahi*.

The concessionaire, Mr. Toshitaro Suzuki, 33, went to Lima, Peru, to join his father soon after being graduated from the Tokyo Veterinary School. He soon moved to Eduador, and after living there for two years, returned to Japan to study the cultivation of the cinchona tree and methods for the manufacture of quinine. Following his return to Ecuador, he has been petitioning the Ecuadorean Government for a permit to raise cinchona trees and to manufacture the drug. The permission was granted recently.

Although Ecuador has been well-known as a producer of quinine, the medicinal qualities of the cinchona bark having been first discovered on the Pacific coast of South America, Ecuador has been outstripped by both England and Holland in the production of quinine. Recent experiments looking toward the improvement of the cinchona have not been as successful as hoped. Great Britain and the Netherlands are now reported to be in control of the production of 90 per cent of the world's output of the drug.

The *Asahi* says that the Ecuadorean Government has entrusted Mr. Suzuki with the task of winning back for Ecuador again the place it once held in the production of quinine.

Japan's actions in China are the expression of a just and legitimate right to expand its power by "fairly sharing all the fruits and opportunities offered by mother earth," according to a statement issued to foreign correspondents in Tokyo by the Institute of the Pacific, a relatively new organization composed of leading Government officials, officers of the Army and the Navy, members of the Diet and retired diplomats.

The statement was issued in the form of an answer to the recent speech made by the American Ambassador, Mr. Joseph C. Grew, who was urged to make "further study" of the fact that a *de facto* war is going on in this part of the world.

The American Ambassador's speech, it was charged, was guilty of the "glaring omission of the word 'justice.'" The statement declared that peace unaccompanied by justice is merely the negation of violence and an empty conception. Americans are said to envisage a "legalistic" peace, which is further described as "nothing but the maintenance of the *status quo* among nations" and "the perpetuation of the situation that permit satiated nations to remain so forever, while the less favored nations must be content with their present lot for years to come."

Since it was formed in May of last year, the Institute of the Pacific has been engaged in organization activities and gathering research material for publication.

One of the directors of the institute is Premier Abe. Foreign Minister Kichisaburo Nomura is said to have attended its meetings regularly. Other directors of the organization include Admiral Ryozo Nakamura, Mr. Kenkichi Yoshizawa, former Foreign Minister, Mr. Yukio Sakurauchi, former Commerce and Industry Minister; Mr. Toshio Shimada, former Agriculture and Forestry Minister; Mr. Noboru Ohtani, head of the Nippon Yusen Kaisha; Mr. Shozo Murata, President of the Osaka Shosen Kaisha: Mr. Yoshiaki Hatta, former Commerce and Industry Minister, and Mr. Aiichiro Fujiyama, sugar magnate.

Mr. Yosuke Matsuoka, Cabinet adviser, and Mr. Hidejiro Nagata, former Overseas Minister, are Vice-Presidents.

* * *

Forced to remain in Shanghai for the duration of the war the German mv. *Ramses* of the Hamburg-America Line is now anchored above the Nantao boom near the Dollar Wharf. The 11,000 ton freighter moved upstream from the D.K.K. wharf, where she had been docked since October 18. Prior to that she had been anchored off Woosung since the war broke out on September 3.

A total of 88 German sailors are at present on board the *Ramses*. Of these, 33 are the former crew of the German steamer *Odenwald* which is now seeking haven in Yokohama Harbor. It will be recalled that the Chinese crew of the *Odenwald* arrived in Shanghai in the ss. *President Pierce* from Yokohama. Two of the Chinese died while on board the American President Liner.

The German crew of the *Odenwald* were taken off the vessel prior to her departure for Japan about September 1, and were taken on board the *Ramses* to sail for Germany via Dairen and other ports. The German crew of the *Odenwald* were replaced by a crew of 37 Chinese signed on in Shanghai for the trip to Japan. The *Odenwald* had barely reached Japan, however, when war was declared and the vessel was forced to seek refuge in Yokohama and discharge the Chinese crew.

Meanwhile the *Ramses* was caught off Woosung with a full load of cargo for Japanese consignees in Manchuria on September 3. Fearful to run the risk of trying to slip by the British China Fleet the *Ramses* remained anchored near Woosung for a month and sixteen days and eventually, at the request of the Japanese authorities, she came back upriver to the D.K.K. wharf and unloaded all the cargo she had taken aboard for Manchuria. Most of this cargo appeared to be machinery.

After unloading, the Hamburg-America agents here obtained special permission from the Japanese authorities to allow the vessel to proceed to a point above the Nantao Boom to anchor. There the ship is at the present and there she will probably remain until the war is over. Whether or not the 88 German sailors will remain on board during the *Ramses'* stay in Shanghai could not be determined. It is understood that the officials of the Dollar Wharf have granted permission to the men to use the Dollar launches while going back and forth on shore leave.

The American Congress will be asked in January to authorize a new $1,300,000,000 naval expansion program calling for 95 additional warships and about 2,400 planes. The proposal provides for a 25 per cent increase in total naval tonnage and a five per cent increase over the 1937 program.

Representative Carl Vinson, chairman of the House naval affairs committee, in an interview explained that the existing state of world conditions is responsible for the project.

No battleships are contemplated under the proposed authorization. However, the bill will provide for the construction of cruisers and other heavy ships. Altogether, it seeks authorization for three aircraft carriers, eight cruisers, 52 destroyers, 32 submarines and 31 auxiliary vessels, totaling 126 new combatant and noncombatant ships.

In addition, the proposal provides for new naval planes and 36 lighter-than-air craft.

The proposed legislation seeks authorization for the President to alter the building program within specific categories if necessary in the "best interests of National defense."

Representative Vinson said the legislation already has been drafted and that the naval affairs committee will begin hearings on it on January 8, 1940.

He said when the program has been completed by about 1944, the number of modern craft in the navy's possession will total 15 battleships, 59 cruisers, 11 aircraft carriers, 173 destroyers, 87 submarines, 5,400 planes and 36 lighter-than-air craft. In addition, there will be a number of over-age but useful vessels, which will include eight battleships, six cruisers, 32 submarines and 120 destroyers.

A survey of the shipbuilding industry indicates that the bulk of construction could be completed within three to four years "if a special effort is made," Representative Vinson said. "In order to facilitate the building program, Congress will be asked to repeal the provision of existing law requiring 50 per cent of all naval ship construction be done at navy yards and permit the Secretary of Navy to advance 30 per cent of the cost to contractors * * * the present navy will be sufficient for protection of the United States against a single aggressor, but insufficient against a possible combination of aggressors."

Referring to the recent widespread discussion of a two-ocean navy for the United States, he said he would not hesitate to recommend such a sea force if necessary. However, he said at the present time it was his considered opinion after receiving technical advice that "our defense needs would be served best by effecting an increase in our present fleet."

* * *

The next ordinary national budget of Japan has been fixed by the budget bureau of the Finance Ministry tentatively at between Y4,700,000,000 and Y4,800,000,000, according to the *Asahi* and other papers. This figure includes basic budget estimates of Y3,700,000,000 and new demands of Y1,100,000,000.

At first, the total budget estimates, as submitted by various Ministries, amounted to more than Y7,000,000,000. Since last August the budget bureau has been concentrating on how to reduce this huge total. Now that it has adopted tentative estimates, it will submit them to a conference of the Ministry's bureau directors and after fixing the final figure will present them to the Cabinet. As a result, a Cabinet meeting on the budget will be held late in November.

The bureau has succeeded in reducing the new demands of all Ministries to about one-third of the total to about Y1,100,000,000. The Finance Ministry has been concentrating on expenditures necessary for the disposal of the China incident. Special consideration also has been paid to possibly large expenditures for improving national defense productivity expansion, completing National General Mobilization, encouragement of trade, and strengthening of measures behind the guns.

Expenditures set aside for the relief of calamity-stricken districts and public works also are fairly heavy. In co-operation with the Cabinet's Planning Board, the budget bureau has taken steps to readjust the Ministries' new demands in accordance with the actual situation. The Government expects to raise Y3,000,000,000 by taxation, including a natural increase in taxes and to limit bond issues for the ordinary accounts to Y2,000,000,000.

The number of Japanese nationals residing in North China at the end of September totaled about 177,000 according to a survey conducted by the Japanese Consulate-General in Peking. The survey also revealed that the number of Japanese in North China are increasing by about 7,000 monthly. Of the total, 139,300 come from Japan Proper, while 37,382 are Koreans and 353 Formosans.

The number of Japanese residents at the end of last month is placed at more than 200,000 in view of the fact that about 24,000 who evacuated the Tientsin area, where the largest Japanese community in North China is located, because of the severe floods in July, recently returned to Tientsin.

The September survey distributed the Japanese residents as follows: Peking, 30,812; Tsingtao, 23,647: Tientsin, 19,096; Tsinan, 11,490; Taiyuan, 9,092; Kalgan, 8,184; Shihkiachwang, 8,184; Tatung, 4,924; Suchow, 3,381; Kaifeng, 2,942, and Khoko, 2,480.

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The *New York Journal of Commerce* says "although less than half of the notice period of the U.S.-Japanese commercial treaty abrogation has expired, such profound changes have occurred in the condition of American commercial relations with Japan that reconsideration of whole programs is urgently required, namely:

"(1) Japan's needs for American goods will certainly be increased by the European War as most goods which had been bought from Europe are now obtained in the United States, thus it is the time for operating a sharp expansion of American commerce with Japan provided artificial obstacles would not be placed.

"(2) Abrogation may result in an imposition of penalty duties on goods arriving by Japanese vessels. However, owing to the war and restrictions which may be imposed on American shipping by the neutrality legislation, it is imperative that Japanese shipping carry the usual proportion of American foreign commerce, particularly trans-Pacific.

"(3) A major change in Japan's foreign policy.

"In view of these fundamental changes, the time is certainly ripe for full, fank discussion of U.S.-Japanese commercial relations."

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The *Mining Journal* reports that a Japanese group has bought the nickel mines and rights of the Empreza Commercial do Goyaz S.A., a Brazilian corporation, hitherto owned by a German group, representatives of Krupp, the armament supplier. The mines are situated in the State of Goyaz, in the municipality of Sao José de Tocantins, one thousand miles away from the port of Santos. The Japanese buyers will soon begin to ship nickel ores to Japan on a large scale; they have already bought ten trucks for transporting the minerals to the railway station, which is 210 miles away. This is the second time that the Japanese have displayed interest in the Brazilian mining industry. A few months ago they bought some hundred tons of copper ore in the Southern Brazilian State of Rio Grande do Sul. This copper had never been used or shipped before. It is interesting to see how the Japanese acquire these materials, which they bought before from the United States and Canada. The same happens in another field: in 1939 they were the biggest purchasers of Brazilian cotton and during the first five months of the year, 31½ per cent of the total Brazilian cotton exports were shipped to Japan and 14 per cent to Northern China, against only 14½ and one per cent during the same period of 1938.

However, the nickel reserves of Tocantins are the largest in Brazil. They have only been known for some twenty years, because the State of Goyaz is still very undeveloped, and the extent of the mines is not yet known. However, there are 2.2 million tons with contents of about five per cent nickel; some samples had even 14 per cent pure nickel. The whole metalfield is estimated at 10 million tons. But the long distance to the railway station and the transport difficulties of four different railway systems (the Goyaz Railway, the Mogyana, the Paulista and the Sao Paulo Railway) to the port of Santos aggravate the economic use of the mines, although the cost of production is very low on account of the low wages and the easy accessibility of the ore, lying only five to ten meters deep. For experiment's sake, the Emprezy Commercial do Goyaz exported 170 tons of nickel ore to Germany in 1934, but the result was, that without concentrating the ores in Goyaz, it would be impossible to sell them at profitable prices. Furnaces imported from Germany for this purpose did not work satisfactorily and consequently the German group discontinued its activity in Goyaz since 1935. It is difficult to understand how the export to Japan which is three times more remote from Brazil than Germany, will be profitable.

* * * * *

The Japanese Embassy at Washington has announced the settlement of several cases affecting American interests in China, including damages caused by the bombing of the Lutheran mission in China. He said major questions regarding the seizure of the American owned Shanghai University had been deferred, but some of the damage to the building had been repaired and arrangements were made for three families to return to the compound.

Other recent settlements were: re-opening of Poplar Grove Farms near Shanghai, although in a territory forbidden to Third Powers; cash compensation to the United Brethren Church at Siulam in Chungshahsien, Kwangtung Province, for damages done by the shells during a naval bombardment; and cash compensation for the seizure by the Japanese of the American-owned junk at Shameen, the foreign settlement at Canton.

The Embassy announced that damages to American mission properties in other parts of China will be "speedily investigated and settled." Cash compensation will also be paid for physical injuries sustained by American missionaries and damage to a junk owned by the American school for the blind at Canton.

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The Soviet Ambassador, M. Constantin Smetanin, and the Japanese Foreign Minister, Admiral Kichisaburo Nomura, will begin negotiations soon, the *Yomiuri Shimbun* predicted recently.

The negotiations will be held simultaneously with conferences in Moscow between the Soviet Foreign Commissar, M. Viacheslav Molotov, and Mr. Shigenori Togo, Japanese Ambassador to Russia. They will be arranged within a few days when M. Smetanin makes a courtesy visit to Admiral Nomura's office, the paper said.

The newspaper added that a decision had been reached for the organization of a joint Japan-Manchoukuo-Soviet Union-Mongolian commission as a result of talks between M. Molotov and Mr. Togo. The commission, the paper said, was expected to meet soon at Chita to define the border in the area involved in the recent Nomonhan fighting.

Meanwhile, an assurance of the increasing friendship between the Soviet Union and Japan was given by Captain Alexandre Kovaleff, naval attaché to the Soviet Embassy.

In a recent press interview aboard the ferry board *Hiye Maru*, which was carrying him from Tsuruga to Vladivostock *en route* home for a visit, Captain Kovaleff was quoted by newspapers as saying that the future was certain to bring close friendship between Japan and Russia.

"Judging by the speech of the Soviet Foreign Commissar, M. Viacheslav Molotov, before the Supreme Soviet Council on October 31, it is not difficult to guess the mission of M. Constantin Smetain, the newly appointed Soviet Ambassador to Japan," declares the *Chugai Shogyo*, leading commercial daily.

The journal states that difficulties have attended previous attempts to readjust the relations between the Soviet Union and Japan, but expresses the opinion that various pending Soviet-Japan questions can be settled, including the Manchoukuo-Outer Mongolia border controversy, the fishery question and the Saghalien oil and coal concession questions.

The *Chugai Shogyo*, therefore, urges the necessity for taking early occasion to settle all pending questions, "regardless of whether negotiations with Britain and the United States are in progress or not."

The *Yomiuri Shimbun*, writing on the same subject, says the Soviet question has far more vital bearing on the disposal of the China affair than the question of the readjustment of relations with the United States.

"The Soviet Union," it declares, "has been looking for an opportunity to expand for 20 years. That opportunity has now come to the Soviet Union."

Great Britain and the British people were willing and ready to change their attitude toward Japan, Mr. Neville Chamberlain was reported to have told the London correspondent of the *Asahi Shimbun*, the Japanese journal reported recently.

"If Japan displays understanding of the legitimate rights and interests of Great Britain, the British people will revise their attitude of opposition to Japan," the British Prime Minister was reported to have told the *Asahi* correspondent.

"The British are always ready to listen to reason and are not people to continue to harp on one theme constantly," Mr. Chamberlain was said to have informed the *Asahi* correspondent.

Britain's attitude toward Japan followed a discussion by the Prime Minister of the European situation.

"Britain is not adept at propaganda work and, in fact, hates the idea," Mr. Chamberlain was reported as saying.

Regarding Anglo-Japanese relations, the British Prime Minister was reported to have informed the Japanese newspaperman that he was ready to consider any reasonable proposals for improvement.

Questioned regarding the possibility of the resumption of the Anglo-Japan conversations on the Tientsin issue, Mr. Chamberlain, the *Asahi* claimed, said that the manner in which the British Ambassador to Japan, Sir Robert Craigie, was handling matters toward improving Anglo-Japanese relations was noted with satisfaction.

"There are few people who have greater concern over the deterioration of Anglo-Japanese relations than myself," Mr. Chamberlain was reported to have said.

"Before I became Prime Minister, I instituted certain activities in the attempt to improve Anglo-Japanese relations but certain circumstances prevented my bringing them to culmination," the Prime Minister was quoted as saying.

* * *

The United States Navy is sending four battalions of U.S. Marines, numbering about 2,800 men, to Pearl Harbor, Hawaii, to reinforce America's "Gibraltar of the Pacific," the Navy Department announces. The first battalion, numbering about 700 men, will sail from San Diego for Pearl Harbor as soon as the complement is recruited, the announcement said. This battalion, which will be the first of the four to reach Hawaii, is expected to sail about February 1, a few days after the Japanese-American treaty of amity and commerce expires on January 26.

The mobile defence Marine battalions, manned at wartime strength, will be equipped with new five-inch anti-aircraft guns and will be specially trained in island landing operations, informed quarters disclosed.

Simultaneously, the Navy disclosed that the New Orleans Navy dock would be repaired immediately and towed to Pearl Harbor to service additional warships expected to be sent to Hawaii before February 1. The Navy awarded a $291,800 contract to Todd Johnson Co. to begin the repair work on the old dock immediately.

Meanwhile, Mr. Anthony Dimond, Hawaiian delegate in the United States Congress, urged Congress through the press recently to appropriate $50,000,000 in addition to the $13,000,000 already appropriated to strengthen American defences in Alaska.

Mr. Dimond said the United States should reply to Russian criticism of Democracy by increasing Alaskan fortifications within 54 miles of Soviet territory.

"We would be a bunch of star spangled fools not to prepare for anything now," he declared. "If Russia and Japan ever move against us, they won't try to cross 4,000 miles of ocean and to crack our strong defences in Hawaii, but they will pick Alaska as a jumping off place to get a foothold in the Western Hemisphere."

The Navy Department meanwhile announced the formation of the new Destroyer Division 73 under the command of Commander James K. Davis. The division comprises recommissioned Great War craft and will engage in the Navy's neutrality patrol.

Fifty-seven of the nation's 110 Great War destroyers, formerly tied up at the San Diego and Philadelphia Navy Yards, have now been placed back into service. The tanker *Platte* also was ordered back into service, presumably to fuel Navy patrol ships.

No additional details were forthcoming on the projected trial flights expected to be held by large squadrons of Navy long range bombers between Honolulu and Manila, but the flights are expected to begin soon. They are expected to be co-ordinated with the new "security patrol" recently established in mid-Pacific by more than fifty American warships which moved west from the west coast in October.

The squadron which will double the submarine strength of the United States Asiatic Fleet is expected to reach Manila within the next month but Navy officials declined to disclose the location of the vessels.

* * *

The Japanese press launched a new attack against the United States, particularly against the huge American naval expansion program and the embargo threat aimed at Japan yesterday by the Chairman of the United States Senate Foreign Relations Committee, Senator Key Pittman.

The recent actions of the United States toward Japan, the Japanese press alleged, constitute "attempts to coerce Japan."

"Japan," the papers said, "will not bow to American threats and will pursue her plans for a 'New Order in East Asia.'"

"Japan will not retreat a single inch, even if resisting America results in angry waves washing the shores of the Pacific," said the influential *Asahi Shimbun*.

The Japanese Foreign Office spokesman also warned the United States against carrying out its proposed naval expansion program.

"If such a plan is passed," he said, "we as Japanese cannot remain indifferent. Statesmanship on both sides of the Pacific should strive to avoid friction. The Japanese are trying to keep Japanese-American relations as tranquil as possible but passage of the American naval expansion bill would result in a changing atmosphere in this country."

The spokesman, who recently said American public opinion toward Japan was simply a matter of emotion, said that Japan is not concerned over reports that the United States and the Netherlands are negotiating an agreement under which the United States would guarantee the safety of the Netherlands East Indies in return for special economic concessions in the islands.

The *Hochi Shimbun*, which frequently reflects the opinion of the Japanese army, meanwhile advocated the signing of a Russo-Japanese non-agression pact and the establishment of close economic relations between the two countries.

The paper simultaneously warned Third Powers in China, particularly the United States, not to exert undue pressure against Japan because such action might drive Japan into even closer relations with the Soviet Union.

The paper's about-face in advocating closer relations with Russia came after observers here noted a significant change in the attitude of Japanese army officers toward Russia.

Until a few weeks ago, unyielding hatred for the Soviet Union was the by-word of the Japanese army, but in the past fortnight army officers have been heard saying: "Japan need no longer fear Russia because the Moscow Government no longer represents the Third International."

The *Hochi Shimbun* said Japan and Russia should sign a non-aggression pact "so as to avoid their being driven to take the last resort."

The paper said that even the current negotiations for the demarcation of the Outer-Mongolian-Manchoukuo boundary would not lead to lasting peace between the two countries and declared that a more formal bond of friendship should be established.

"The demarcation of the northern frontiers," the paper said, "may do away with careless invasion of Manchoukuo by Soviet troops, but it cannot guarantee the absolute elimination of uneasiness over the frontiers between Japan and the Soviet Union unless and until the Soviet Union abandons her policy of expansion in Asia.

"The conclusion of a Russo-Japanese non-aggression pact may give rise to suspicion and jealously among the Democratic countries such as the United States, Britain and France, but since Japan does not mean to conclude an offensive and defensive pact or an aggressive military alliance so as to share the fate of the Soviet Union, there is no reason why Japan should be censured by Third Powers for the conclusion of a mere non-aggression pact.

"So long as either the United States or Britain pursue their blind policy of driving Japan and the Soviet Union into entering a closer relationship than a mere non-aggression pact, this pact will be an important mission imposed upon both Japan and the Soviet Union for the readjustment of their delicate relations."

Beware the Ides of February

It was precisely when Anglo-Japanese negotiations at Tokyo had begun to make progress toward adjustment of Far Eastern problems that the Washington Government made its dramatic announcement denouncing the American-Japanese Trade Treaty of 1911. Officials of the American State Department have let it be known that no prior intimation was given to other governments concerning the intention to terminate the treaty. By many this unexpected action at Washington was seen as a gesture to give support in the Far East to Great Britain, but in view of the way events have begun to fall out, it is not hard to imagine perplexed statesmen of the British Foreign Office saying fervently to French confreres, God save us from our friends !

In the vast Far Eastern section of this planet Great Britain is a major shareholder, and a quite possible consequence of the action the American Government has seen fit to take at this time is that the whole British estate in this part of the world, which is linked closely with far-flung policies, and even with the destiny of the Empire itself, is placed, perhaps needlessly, in jeopardy. This hazard for Great Britain must grow more imminent in direct ratio with the extent to which the American Government proceeds in carrying out the ultimate purpose that Washington appears to be contemplating.

Since time when the United States Government has had any concrete Far Eastern policy at all, this policy has centered upon two basic tenets—the Open Door principle and the administrative and territorial integrity of China. The first Roosevelt enunciated an American viewpoint years ago about the Open Door principle asserting that " it was a good thing, but it was not worth fighting for. " The sole purpose of the Open Door pronouncements was the expansion of American trade in the Far East, but after forty years operation of this principle, which at times has brought the American Nation to the brink of conflict, the position of American Far Eastern trade remains where it was at the beginning—almost entirely prospective. And those who have clung so zealously, and still cling, to belief in the principle can find but cold comfort in the common judgment of economists that the Open Door for Americans is but an illusion, which has brought losses and no gains to the American people.

Whether the pundits of the present day at Washington adhere to the viewpoint of the first Roosevelt on the Open Door has not been clearly disclosed, but it is very certain that the opposition of the American people to all forms of armed conflict has strengthened greatly through the passing years. The American Nation definitely is averse to any territorial commitments in the Far East, seeks no dominant place in commerce, and wants no political entanglements in this part of the world. In an international sense the American holdings in the Far East cannot be regarded as pretentious, and it is certain that the slender American interests could never survive, if the vastly larger British holdings should be liquidated.

While the Open Door principle was conceived with the expectation of a resulting expanded American trade in the Far East, the American purpose to maintain the administrative and territorial integrity of China rested upon the belief that this line of policy would expedite and, in fact, guarantee successful operation of the Open Door principle leading to trade expansion. Also the American quality of altruism then was flowering ; we wanted to help China. The Open Door principle was a hybrid concept, for it was fathered by British influence and fostered by succeeding American administrations. The related purpose to maintain the administrative and territorial integrity of China appears to have been purely an American conception, which was given to a doubting world when the Open Door pronouncements were made. Maintenance of the administrative and territorial integrity of China certainly was a large order, and it seems that the projenitors of the idea took no account of the fifty-odd centuries of Chinese history through which China herself has never been able to achieve administrative and territorial integrity. At some future time the Finns and the Greeks, the Germans, the Italians and the French, the Scandinavians and the Czechs and all the other racial and national groups of Europe may be fused into harmonious democratic unity. Whenever this happens a formula may be discovered with which the various racial and tribal groups in China, less closely knit together by cultural and other bonds than are European peoples, may be welded into unity and attain realization at length of the American aim of administrative and territorial integrity for the land. These things may be beyond the scope of any human power and may not be brought about by any means short of Divine intervention. But we Americans are a pious folk.

The American Government and, under spur of various influences, many Americans are dissatisfied and are gravely displeased with the way things have been going in East Asia. American distrust of Japan first took nebulous form in the years immediately after the United States acquired the Philippine Islands. This trend of feeling was strengthened greatly when Japan vanquished Russia in the war of 1905, for by this victory Japan emerged as a first class power and became a force to be reckoned with. In later years the American sentiment gained added momentum from events that took place in the years of the World War when Japan occupied the former German port of Tsingtao and the province of Kwangtung and presented the Twenty-one Demands on China. Then Japanese expansion into the Asiatic mainland ran headlong into the then current Wilsonian conceptions of international morality, when the Japanese seemed reluctant to withdraw their troops from Siberia after the allied armed adventure into that part of the world. Maintenance of the integrity of Russia then became an off-shoot of the American doctrine for the maintenance of the integrity of China.

The outbreak of the Manchurian Incident in 1931 fanned the flame of American resentment into new intensity, for then the American Department of State assumed a world leadership, even over the League of Nations, which the United States had refused to join, in opposing Japanese actions. A formidable indictment was then brought against the Nipponese. It charged that in going into Manchuria Japan had shattered the integrity of China, had walled up the Open Door, and had flaunted Kellogg Treaty and the Nine Power Treaty. Japan was hampered greatly by the increasing pressure of international opposition, but events carried the Nipponese on their course relentlessly into the present conflict with China, which has brought her into control of the whole China seaboard with all the ports and channels of communication. Inevitably these current hostilities in China have caused embarrassment and great losses to third power interests in China.

For all her scarlet sins Japan has been convicted unheard. As the defense of her actions is held to be without consequence or merit, it has seemed pertinent here to present only one side of the case. It may be observed, however, that the primal law operates with a much greater and more ruthless force with nations than with individuals, and neither the individual nor a nation engaged in a death struggle for existence will be able to give much heed to abstract principles moral or immoral, or to have any nice regard for the convenience or for the property of bystanders. The Japanese have appeared to be entirely incapable of comprehending the American viewpoint regarding the Far Eastern situation. It is abundantly evident that Americans have no sympathy with or understanding of the " new order in East Asia," which is the cardinal element of the Japanese viewpoint.

The inability of the two Powers to understand each other may be attributed in some degree to physical and geographical differences between the two nations. It is to be seen, too, that national moral attitudes undergo great changes with the passage of time. It may well be, after all, that the Americans in fact are the Chosen People, for it is certain that they have been favored by a beneficent Providence above all other peoples of the earth, and singular fortune has attended them from the beginning. Unlike the Britons, Americans have not had to do much fighting for their gains or engage in conquest. It was not merely the sagacity of our statesmen of the time, but it was also a streak of good luck for us that Napoleon badly needed cash when we effected the Louisiana Purchase and acquired the Mississippi Valley. We got another bargain of the same kind when we bought Alaska from the Russians, though this " Seward's folly " was achieved only over strong opposition. In our early days of expansion we were not specially concerned over the "sanctity of treaties," for in dealing with the Indians when we wanted their lands we had scant regard for covenants we had entered into with them. We adopted simple courses of expediency when we wanted to expand, so without particular regard for a weaker neighbor, as painlessly as possible, we amputated from Mexico California and our vast priceless southwestern empire. When we wanted to build a ship canal separating the two Americas we blithely overrode the objections and obstacles raised by a neighboring country and created in territory of that country a new state, in a fashion not unlike that followed by Japan in the creation of Manchoukuo. Then on principles of the "higher morality," acting in the best interests of all peoples of the world, we dug the Panama Canal.

From the beginning Americans who desired anything had but to go into their back yard and get it, for almost every resource we might need was to be found in that back yard. We were given wholly amiable neighbors and insuperable natural defense barriers so that no idea of external menace ever could take form in the mind of any American. Riches and security have always been ours and perhaps it has been our very affluence that has given us a form of astigmatism when we look upon peoples less well endowed than ourselves. We seem to assume the false attitude and get into the state of mind of that royal lady who looked down with disdain upon a starving tattered horde screaming for bread, and wanted to know, "Why don't they eat cake ?"

Perhaps the greatest difference of all between the Japanese and American Nations is that almost through the whole course of American history, and particularly through the history of American foreign relations, the Government has been able to choose any one of a number of courses of policy, or, in short, to do as it pleased without ever endangering the Nation. This priceless option became a thing so commonplace that on occasion it has even been exercised by individuals. Some forty-odd years ago the American people had no special ill feeling for Spain and were not conscious of any need to go to war with Spain. Mr. William Randolph Hearst and Mr. Joseph Pulitzer, however, were of the opinion that we should fight. So, despite all the Spanish efforts to negotiate and avert the conflict, we fought the Spanish-American war, not in defense of any vital American interest, but in some measure to increase the circulations of the Hearst and Pulitzer newspapers.

In contrast with the American freedom of choice in fixing lines of national policy the Japanese through the eighty years that they have had contact with the outside world have been confined to lines of policy within fixed grooves, not of their own making, but created by external circumstances that frequently developed from the rivalries of Occidental powers striving against each other and against Japan for special advantages in East Asia. With a population roughly half as great as that of the United States the Nipponese inhabit a group of mountainous islands in a homeland sadly lacking in all those resources essential for national progress. With arable land of a lesser area than the areas of many American states they have difficulty in producing enough to feed the close-packed population, and with all portals of the Occidental world closed against them, they have had to struggle to survive living in the menacing shadow of a formidably powerful unfriendly neighbor power situated almost within gunshot of their shores. Within the span of a lifetime they have surmounted all these adverse conditions and have attained adult stature in the family of nations, no mean historical achievement.

Through the troubled record of the past eight years in East Asia Japan has steadily fallen in favor in the eyes of governments of Occidental powers, whose anxieties and resentment have sharpened as their Far Eastern interests have been menaced. It now appears that Nipponese leaders were not well advised when they linked their Empire to the Rome-Berlin Axis in the anti-Comintern pact, for this contact gave only a false security, lasting only long enough to lead the Japanese, through further objectionable actions in China, into new tensions and more bitter controversies with the Occidental powers. The alliance between Germany and Russia came as a stunning disillusionment, for this betrayal left Japan in a position from which it is difficult to recede and compelled the Tokyo Government to reshape and revalue all the foreign relations of the Nation. In some respects parallels with the situation which led to the Anglo-Japanese Alliance of nearly forty years ago may be seen in recent events. Perhaps a slight probabilty exists that history will repeat, for there have been signs in the course of the recent Anglo-Japanese discussions at Tokyo that Far Eastern problems were heading in this general direction. Also all the causes that brought the original Anglo-Japanese Alliance into being are to be found in the present situation. The action that the United States Government has taken in abrogating the Trade Treaty seems to have changed the whole picture, and how far the United States will go with the course of action begun, and what ultimately the American Government will do, have become vital questions. The balance of power in the Far Eastern situation now rests with the United States Government, for the American Government has placed itself in the pivotal position with power to point the direction that events must take. It is a grave responsibility.

In the worst eventuality, from the Japanese viewpoint, Senator Key Pittman of the Foreign Relations Committee of the Senate will carry out his already announced intention and introduce in the American Senate a resolution empowering the President to place an embargo on Japanese trade ; the measure will be adopted and President Roosevelt will proclaim the economic blockade against Japan. It is foreseen then that Great Britain and France will take parallel action. For the Japanese Nation these successive blows will be crippling and disastrous—perhaps not mortal. For weeks Japanese economists and statesmen have been calculating consequences that must follow such a train of events. Real suffering will first be felt in the lower social brackets, particularly in the rural districts where populations must be brought to a starvation diet with popular distress spreading under a steady advance of commodity prices that will set at naught control measures. As imports and exports swiftly decline lesser manufacturers will be wiped out for want of raw materials and the already existing extensive government controls will have to be expanded into a form of state socialism under which enterprises in general will have to operate under close supervision. All efforts to stem the course of general inflation may prove futile. The position of the Japanese people in such a situation would differ from the situation in Germany toward the close of the Great War only in the circumstance that Japan would continue to retain control of considerable resources, not only in Manchuria, but also in North and Central China. Armament production on a large scale and government expenditure therefore, would continue, and the fighting in China would be intensified with no holds barred. This last is a contingency already giving grave concern to American and other third power commercial interests in China.

Perhaps from the viewpoint of the western democracies the worst eventuality that may grow out of this situation is that once again Japan will find herself thrust by external pressure into a position in which she will be able to see but a single course of action open holding any chance of survival in the place she has attained. Trends in this direction already are clearly taking form. One reads in the papers about talks at Tokyo of Comrade Constantin Smetanin, the Soviet Ambassador, with Japanese Foreign Minister Kichisaburo Nomura, while other conversations proceed at Moscow between the Japanese Ambassador to Russia and Comrade Vyacheslav Molotov. Related to these discussions one at once recalls the kindly sentiments regarding Japan of the Soviet Foreign Commissar voiced in the address he gave at the Fifth Supreme Soviet Council meeting on October 31 last. Russia is ready to negotiate with Japan, said the Soviet dignitary then.

Japan will turn toward her traditional foe reluctantly as a last resort only when other expedients have failed and when it appears to her that this is the only possible course she can take. It is a path she has travelled before, for it must not be forgotten that she felt herself obliged by acts of western powers in Manchuria and in China to conclude a series of treaties with Russia in the years immediately following the Russo-Japanese war when feeling between the two nations was mutually more hostile than it has been even through the recent period of the Nomonhan border fighting. Japan undoubtedly recognizes that this for her indeed is a desperate expedient and the hazards it imposes assuredly will cause her to erect every possible safeguard if at length she feels she has to join Russia, an action that must lead directly into a new more sinister rapprochement with Germany. All this can only serve to bring closer another and more terrible general world war.

When United States Senator Pittman submits his resolution some time after January 29 next when the Trade Treaty of Japan and the United States finally is made invalid, it behooves the United

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"Out of the Horse's Mouth"

Here, given textually, all unadorned and unchanged, is the much publicized speech of Mr. Joseph C. Grew, United States Ambassador to Japan. It is to be remembered that this historic address was delivered before the America-Japan Society on October 19, at Tokyo, shortly after the Ambassador returned to Japan from Home leave, and while certain introductory passages have but local application, and for that reason may seem to the general reader to be extraneous, they are retained here nevertheless, so that the continuity and entirety of the document may in no way be impaired.

* * *

Mr. Chairman, Ladies and Gentlemen: First of all, permit me to express my great satisfaction on returning from leave of absence to learn that there has been improvement in the health of our beloved President, Prince Tokugawa. I well know that I am reflecting the hopes of all of us in most heartily wishing that he may before long find complete recovery and return to the chair which he so long has occupied with distinction and great helpfulness. I beg that our Chairman to-day may be good enough to convey to the Prince an expression of this deep feeling.

Your welcome to-day is genuinely appreciated. Last spring we were going "home" to the United States, and this autumn, when we left America, we were going "home" to Japan. When one has remained for seven years at a post, one can hardly regard it as other than "home." At any rate, that is the way my wife and I feel about Japan and especially about Tokyo, and that same feeling extends to our friends here, both Japanese and American. To come once again to a gathering of this Society is to come into a homelike atmosphere, and that in itself gives us a very warm feeling. We thank you for your welcome.

I have been told of rumors that have been flitting about here and there to the effect that we were not returning to Japan. If there have been such rumors, they just have been based on speculation, pure and simple, for at no moment has there been the slightest doubt about our returning. Having been on the job here for approximately three years without a day of furlough, I was very considerately given an extra month of leave, over and above the usual 60 days in the United States. Some of you with whom I talked before our departure may remember that I said at that time that I expected to be back in September or October, and here we are, right on schedule. Our plans have undergone no change and no thought of change.

Japan's Fair Exhibits

We have had a pleasant and interesting time. Much of our furlough was spent at our place at Hancock in the refreshing hills and woods of New Hampshire where we were surrounded by our three daughters, occasionally some sons-in-law and six grandchildren, which inevitably made me feel something like an old patriarch, but we had time for visits also and we saw both the New York and the Golden Gate world fairs which, of course, were thrilling. I visited Washington on three occasions.

With regard to the world fairs in New York and in San Francisco, I think that Japan has every reason to be proud of her pavilions and exhibits. I spent much time studying them in both places. The Japanese pavilion in the New York Fair is of great beauty. The Japanese exhibit in the division of pacific cultures at the Golden Gate International Exposition and the effective way in which it is presented is past all praise. These objects, portraying the historical sequence of Japanese art and culture, have most courteously been lent not only by many of the foremost Japanese collectors, many of them personal friends of mine, but also by the Imperial Household Museum. As Mr. K. Sato wrote in the official catalogue of the department of Fine Arts of the Expositions:

"It will be a surprise to us if you do not read from these material objects the spirit of the race that made them, so like and so different from your own.

"Surely America, newly come to join us on the rim of the Pacific Ocean, will feel the splendid lift of the same tides that wash our beaches."

Yes, we in America do feel the life of the same tides that wash the beaches of Japan. I hope that both our nations will always and progressively feel the lift of those tides of friendship. I have returned to Japan to devote all that I have to give, now and in future, to try to inspire new life in those tides.

As for the future, Mrs. Grew and I are going to try to return to the United States as often as possible—every year or two if it is feasible, although such a plan must necessarily depend upon many unpredictable factors and is perhaps just a bit optimistic. But there is no doubt in my mind that an ambassador can do more helpful work and more intelligently and effectively represent his Government and can better contribute to clear international understanding upon which good international relations are built when given frequent opportunity for personal contact with his Government and the people of his own country. As I have often said, indeed as I said not long ago before this distinguished Society, an ambassador is essentially an interpreter, an interpreter of official and public opinion as they exist in his own country and in the country of his residence. By going home this year I was able to do a great deal of interpreting of Japan and of Japanese opinion both to my Government and to the American people. A number of addresses were made to important groups and I talked with a large number of people. I hope and believe that my interpretations were fair and accurate. It was made very clear that the Japanese picture has many sides and many angles, and that without a comprehension of these many sides and angles, it is difficult if not impossible for another people far away to arrive at a clear and accurate conception of the basic causes and incentives that lead to Japanese thought and policy and action. Those talks aroused much interest.

I enjoyed several constructive talks with my good friend Ambassador Horinouchi, who is ably representing Japan in our country, and with other Japanese visiting or residing in the United States.

Talk to be "Straight"

In the same way, there can be no doubt that as a result of my stay in the United States and my personal contacts with a large number of Americans, both official and unofficial, my interpretations here of American thought and policy and action are going to be much more complete and accurate than they could have been had this summer's furlough not taken place. We have a phrase in English "straight from the horse's mouth" I never knew why the particular animal chosen was a horse, especially as most horses are generally not very communicative. But the meaning is clear enough. What I shall say in Japan in the ensuing months comes "straight from the horse's mouth" in that it will accurately represent and interpret some of the current thoughts of the American Government and people with regard to Japan and the Far East. I had the privilege of also conferring repeatedly with the President and with the Secretary of State during my stay at home.

But here I am constrained to pause before passing on, to pause in sadness, in deepest sorrow, yes and in impotent bitterness, at the dreadful holocaust that has broken loose in Europe, a holocaust not of God's doing but of man's. That we, in our lifetime, should have to pass through another such frightful disaster seems an intolerable burden for one generation of humanity. I shall not try to deal with that subject to-day; indeed, what could possibly be said to alter in any infinitesimal degree the blackness of the cloud that has descended upon us? I say "us" advisedly. I pray with all my heart and mind that we in America may be spared from participation again in armed conflict, but in this modern world of ours no nation and no people can emerge unscathed from the effects, direct or indirect, of warfare anywhere. When the structure of international good faith, when the reliance of mankind and government upon the inviolability of the pledged word becomes undermined and collapses, when might makes right and force becomes an instrument of national policy rather than discussion and settlement of disputes by peaceful means, then civilization crumbles also and chaos intervenes.

Thoughts in America

I turn now to some of the thoughts of the American Government and of the American people with regard to the situation in East Asia in general and to our relations with Japan in particular. It is trite to say—but all too often the fact is overlooked—that in our democratic system the policies and measure of our Government reflect, and inevitably must reflect, public opinion. If therefore in any given case or situation we search for the underlying causation of American policy, or of any specific measure, or series of measures taken by our Government. we must first try to analyse the state of public opinion in the United States and the developments which have induced that state of public opinion, factors which in turn have given rise to some specific policy or some specific measure or measures of our Government. In this connection I have not for a moment lost sight of the force of public opinion in Japan.

Obviously American public opinion is frequently divided; seldom is it unanimous. In the face of a divided public opinion, the Government must choose between acting according to its judgment as to what will best serve the interests of the country and withholding action altogether. But when public opinion is unanimous, or nearly unanimous, then governmental policy and action must and will reflect the opinion and wishes of the people as a whole. For the American Government is the servant of the American people. American public opinion with regard to recent and current developments in the Far East is to-day very nearly unanimous, and that opinion is based not on mere hearsay or on propaganda but on facts.

Among the conditions existing in the United States which impress me more and more vividly each time I return to my country are, first, the freedom which prevails in public discussion, and second, the demand for knowledge of facts and the intelligent appraisal of those facts by men and women in every walk of life. Especially is this true to-day in regard to foreign affairs. It is not alone the Government official or the student or the businessman or the manufacturer or the financier who keeps his finger on the pulse of our foreign relations. This interest—and it is a keen, living interest—extends to the masses—the factory hand, the servant in the house, the taxi driver in the street. In the past few months at home I have been immensely impressed by the intelligent grasp by people in every quarter of what is going on in every corner of the world. I have been drawn into discussion of foreign affairs not only by men and women in important and influential positions but by travelers in the smoking compartment of railroad trains, by the stewards in airplanes, by the men and women behind the counters in the stores and shops, by the attendants at gasoline stations, by the drivers of taxis who were taking me to some destination. And what impressed me most was that these people not only knew what was going on abroad but had formed their own individual opinions of those events and of what the United States should or should not do about it. Those people, mostly, are widely read. My chiropodist, when I entered his room, was reading an important book on Japan, and we discussed that book throughout the session. A farmer in the small New England village where we live lent me another recent book on Japan. In the many talks which I had with many, many people, I received the distinct impression that those people are sufficiently well-informed and sufficiently wide-awake to distinguish between fact and propaganda. I do not suppose that any country in the world is better served to-day, by press and radio, with accurate foreign information than is the United States. In every country there are of course certain elements of the press inclined toward sensationalism, but the vast majority of the American people to-day read and demand the dispatches and comments of correspondents and commentators of proved reliability for accurate reporting. Propaganda not based on fact, or distorting fact, is anathema to the average American. And the senseless propaganda with which foreign countries sometimes try to influence public opinion in our country does the countries of its origin and the interests of those countries far more harm than good. The average American, knowing the facts sees through it and will have none of it.

Tremendous Force

Here, then, is the stuff of which public opinion in the United States is built. It is only through such individual contacts as I enjoyed this summer that one comes to appreciate the tremendous force of public opinion in our country and to realize its fabric and its power. When such opinion tends toward unanimity in any given issue, it is a force to be reckoned with, a force which the Government cannot possibly overlook and will not fail to reflect in its policies and actions.

What am I to say to you to-day? Would it be the act of a friend of Japan, a friend of the members of this Society, would it be in the interests of Japanese-American relations which this Society steadily labors to build up and improve, if I were to misstate the truth or try to obscure it by painting an inaccurate picture of my observations at home? If an Ambassador is in effect an interpreter, mustn't he interpret correctly on the basis of facts known to him? And on returning from a long stay in America, would it not insult your intelligence if I were to talk of trivialities? I suppose that there is not a person here who does not know that American public opinion strongly resents some of the things that Japan's armed forces are doing in China to-day, including actions against American rights and legitimate interests in China. On that subject public opinion in the United States is unanimous. And, mind you, I know whereof I speak, from personal talks with a very large number of people in diverse walks of life throughout our country, constituting a reliable cross-section of the American public.

If we then accept as a regrettable fact this state of American public opinion, and we must accept it as a fact, then isn't it from every point of view, especially from the point of view of statesmanship, reasonable and logical that we should in all frankness examine the basic causes of that state of public opinion? I know those causes in general and in detail. It would be harmful to overlook them. I earnestly believe that these causes must be removed and that by their removal only constructive good can come to both our nations. The attainment of such mutually constructive good, needless to say, is and has been and always will be the fundamental purpose of my ambassadorship to Japan.

A Japanese Viewpoint

Before I left for America last May a Japanese friend of mine begged me to tell my friends in America the situation in Japanese-American relations as he conceived it. It ran somewhat as follows:

American rights and interests in China are suffering some minor and unimportant inconveniences in China as a result of Japanese military operations; the Japanese military take every possible precaution to avoid inconvenience to American interests; reports published in the United States in regard to damage to American interests by the Japanese in China are intentionally exaggerated in order to inflame the American people against Japan; in large measure those activities of the Japanese to which Americans object are the result of differences in customs, differences in language, and a legalistic attitude which has been adopted by the United States; the attitude of the Government of the United States in regard to impairment of American rights and interests in the Japanese-occupied areas of China is in large part due to internal political conditions in the United States; in the near future the situation in the occupied areas of China will be so improved that the United States will no longer have any cause for complaint. That was the point of view of my Japanese friend.

Alas, the truth is far otherwise. The facts, as they exist, are accurately known by the American Government. They are likewise known by the American people, and in the interests of the future relations between Japan and the United States those facts must be faced. Only through consideration of those facts can the present attitude of the American Government and people toward Japan be understood; only through consideration of those facts, and through constructive steps to alter those facts, can Japanese-American relations be improved. Those relations *must* be improved.

Having said all this I do not propose to-day to deal in detail with the causations which have brought about that feeling in my country. This is not the occasion to enter any " bill of particulars." Those facts, those difficulties between our nations, are matters for consideration by the two Governments; indeed, some of them are matters which I have been discussing with the Japanese Government during the past two years, and I shall continue to approach these matters. But I believe that the broad outline of those facts and difficulties are known to you. Some of those difficulties are serious.

Two Sides Admitted

Now many of you who are listening to me may well be thinking: "There are two sides to every picture; we in Japan also have our public opinion to consider." Granted. In America, as I have already said, I did my best to show various angles of the Japanese point of view. But here in Japan I shall try to show the American point of view. Without careful consideration of both points of view we can get nowhere in building up good relations. I wish you could realize how intensely I wish for that most desirable end and how deeply I desire, by pure objectivity, to contribute to a successful outcome. Let me therefore try to remove a few utterly fallacious conceptions of the American attitude as I think they exist in Japan to-day.

One of these fallacies is that the American approach to affairs in East Asia is bound by a purely "legalistic" attitude, a conception which widely prevails in this country to-day. What is meant by a "legalistic" attitude? If we mean respect for treaties, official commitments, international law, yes! That respect is and always will be one of the cardinal principles of American policy. But the very term "a legalistic attitude" as it has often been used in my hearing in Japan, seems to imply a position where one cannot see the woods for the trees, where one's vision of higher and broader concepts is stultified. Let me therefore touch briefly on a few of the cardinal principles of American policy and objectives, moulded to meet the requirements of modern life, which, it is true, are fundamentally based upon but which seem to me far to transcend any purely "legalistic" approach to world affairs.

The American people aspire to relations of peace with every country and between all countries. We have no monopoly on this desire for peace, but we have a very definite conviction that the sort of peace which, throughout history, has been merely an interlude between wars is not an environment in which world civilization can be stably developed or, perhaps, can even be preserved. We believe that international peace is dependent on what our Secretary of State has characterized as "orderly processes" in international dealing.

Mutual Respect Desired

The American people desire to respect the sovereign rights of other people and to have their own sovereign rights equally respected. We have found by experience that the successful approach to the resolving of international disputes lies not so much in merely abstaining from the use of force as in abstaining from any thought of the use, immediately or eventually, of the methods of force. Let cynics look about them and contemplate the consequences of resort to menacing demands as a process in the conduct of international relations. Is it being purely "legalistic" to put to wise and practical use the finer instincts common to all mankind?

The American people believe that the day is past when wars can be confined in their effects to the combatant nations. When national economies were based upon agriculture and handcraft, nations were to a large extent self-sufficient; they lived primarily on the things which they themselves grew or produced. That is not the case to-day. Nations are now increasingly dependent on others both for commodities which they do not produce themselves and for the disposal of the things which they produce in excess. The highly complex system of exchange of goods has been evolved by reason of each nation's being able to extract from the ground or to manufacture certain commodities more efficiently or economically than others. Each contributes to the common good the fruits of its handiwork and the bounties of nature. It is this system of exchange which has not only raised the standard of living everywhere but has made it possible for two or even three persons to live in comfort where but one had lived in discomfort under a simple self-contained economy. Not only the benefits of our advanced civilization but the very existence of most of us depends on maintaining in equilibrium a delicately balanced and complex world economy. Wars are not only destructive of the wealth, both human and material, of combatants, but they disturb the fine adjustments of world economy. Conflict between nations is therefore a matter of concern to all the other nations. Is there then any stultification through "legalistic" concepts when we practice ourselves and urge upon others the resolving of international disputes by orderly processes, even if it were only in the interests of world economy? How, except on the basis of law and order, can these various concepts in international dealing be secured?

Commercial Equality

The American people believe in equality of commercial opportunity. There is probably no nation which has not at one time or other invoked it. Even Japan, where American insistence on the open door is cited as the supreme manifestation of what is characterized as a "legalistic" American attitude—even Japan, I say—has insisted upon and has received the benefits of the open door in areas other than China, where, we are told, the principle is inapplicable except in a truncated and emasculated form. That highly complicated system of world economy of which I have just spoken is postulated upon the ability of nations to buy and sell where they please under conditions of free competition—conditions which cannot exist in areas where pre-emptive rights are aimed and asserted on behalf of nationals of the particular country.

I need hardly say that the thoughts which I have just expressed are of universal applicability.

Another common fallacy which I am constrained to mention is the charge that the American Government and people do not understand "the new order in East Asia." Forgive me if I very respectfully take issue with that conception. The American Government and people understand what is meant by the "new order in East Asia" precisely as clearly as it is understood in Japan. The "new order in East Asia" has been officially defined in Japan as an order of security, stability and progress. The American Government and people earnestly desire security, stability and progress not only for themselves but for all other nations in every quarter of the world. But the new order in East Asia has appeared to include, among other things, depriving Americans of their long established rights in China, and to this the American people are opposed.

Increasing Resentment

There's the story. It is probable that many of you are not aware of the increasing extent to which the people of the United States resent the methods which the Japanese armed forces are employing in China to-day and what appear to be their objectives. In saying this, I do not wish for one moment to imply that the American people have forgotten the long-time friendship which has existed between the people of my country and the people of Japan. But the American people have been profoundly shocked over the widespread use of bombing in China, not only on grounds of humanity but also on grounds of the direct menace to American lives and property accompanied by the loss of American life and the crippling of American citizens; they regard with growing seriousness the violation of and interference with American rights by the Japanese armed forces in China in disregard of treaties and agreements entered into by the United States and Japan and treaties and agreements entered into by several nations, including Japan. The American people know that those treaties and agreements were entered into voluntarily by Japan and that the provisions of those treaties and agreements constituted a practical arrangement for safeguarding—for the benefit of all—the correlated principles of national sovereignty and of equality of economic opportunity. The principle of equality of economic opportunity is one to which over a long period and on many occasions Japan has given definite approval and upon which Japan has frequently insisted. Not only are the American people perturbed over their being arbitrarily deprived of long-established rights, including those of equal opportunity and fair treatment, but they feel that the present trend in the Far East if continued, will be destructive of the hopes which they sincerely cherish of the development of an orderly world. American rights and interests in China are being impaired or destroyed by the policies and actions of the Japanese authorities in China. American property is being damaged or destroyed; American nationals are being endangered and subjected to indignities. If I felt in a position to set forth all the facts in detail to-day, you would, without any question, appreciate the soundness and full justification of the American attitude. Perhaps you will also understand why I wish to-day to exercise restraint.

In short, the American people, from all the thoroughly reliable evidence that comes to them, have good reason to believe that

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American Trade and the War

Leading American financial interests as represented by The National City Bank of New York have been studying closely business trends in the United States since the outbreak of war in Europe. Significant differences have been disclosed between the conditions existing prior to and following the outbreak of the World War in 1914 and present-day conditions as related to the new European conflict.

* * *

THE tremendous events of the last forty days of course throw into the discard all previous estimates of the economic situation the world over. The world dreaded war, and despite the tension of the past year was slow to believe that war would come, within 21 years after November 11, 1918. No catastrophe comparable to the war of 1914-18 had been known in the history of mankind. History is mainly about wars, but over most of the past populations were small, and fighting was man to man. No such destruction of life or of wealth accumulations, no such interruption of normal life, as in modern war, was possible. The economic system, in its organization and exchange of services, was comparatively simple, even down to the wars of Bonaparte, when there were no railroads, and but little machinery of any kind. Industry was by the handicrafts, transportation by animal power or sailing ships, trade mainly between neighbors and little disturbed by distant wars.

By 1914, railroads, paved roads and automotive traffic had revolutionized land transportation ; steamships were connecting all continents ; and not only electric cables but Marconi's wireless were flashing messages around the world. The facilities for trade were multiplied and the variety of production and exchange of goods and services was infinitely greater, all for the benefit of the people engaged. The industrial and financial organization had become almost incomprehensibly complex, and its parts were mutually dependent in a degree never approached before.

The war of 1914-18 violently disrupted this organization. Its costs have never been computed and cannot be, for they include not merely the taxes paid and debts unpaid, but the inestimable value of millions of lives, and the cost of the disorganization of trade from then until now. Monetary systems have been wrecked, currencies have become worthless or depreciated, and billions of values have been destroyed.

Lessons of 1914

Most people will form their opinions of the effects of the present war by what they know of the last one, and when they do so should take account of the depression as well as the boom. The last war started a rise of prices and wages that continued into 1920. It is natural that prices should advance in war, which destroys goods, causes shifts of production, and interferes with transportation. However, the rise was not a benefit, but the contrary. Scattered individuals gained, as in the case of farmers who sold wheat at $3.50 a bushel, corn at $2.36, hogs at $23.50 a hundredweight, or cotton at 43¾ cents a pound, provided the receipts were used to pay off debts. But not many farmers, or others, stopped there. War industries made money during the boom, but lost it, and more, in the depression. The rise in wages brought only an illusion of prosperity, for most of the time it trailed the rise in the cost of living.

We know now that the most disastrous effects of the war were suffered after the war was over, and especially after 1929 when the shortages caused by the war had been made good and the inflation of that time had run its course. The problems of agriculture to this day trace back to the war prices and the abnormal and temporary stimulus to cultivation and new developments. Moreover, prices and wages did not come down together after the wartime inflation. Farm prices dropped more than industrial prices, and hourly wage rates least of all, and the disorder in price and cost relationships which then originated has persisted. This disruption of prices and trade relations has ruined tens of thousands of business men, including farmers, and thrown millions of wage-workers out of employment.

The bottom of the great depression, which was due to the war, was 14 years after its end, but the chain of economic sequences from 1914 to 1939 has been unbroken. The fiscal and monetary problems, the difficulties of unemployment, relief, social security, etc., and now the new war in Europe, with its new problems for ourselves—all have a direct line of descent from August, 1914.

It is a strange idea that holds " business " responsible for wars. The aims and methods of " business " are vindicated by the ever increasing and widening distribution of goods to the homes during the century to 1914. " Business " wants peace, order, production, mutual services, and good faith in all relations. It deplores disorder and waste, and is appalled to be confronted by another war. Its problem now is to avoid, so far as possible, a repetition of the costly experiences of the last twenty-five years.

Will History Repeat Itself ?

The new war is one month under way, and the uppermost question is, " Will history repeat itself ? " No one knows how long the war will last, how widely it may spread, how intensive the fighting will be or how great the destruction. These are the keys to what lies ahead, and doubtless the outlook will change often. An early peace would reverse many recent developments.

History may seem to be repeating itself through the sensational advance in commodity prices, which started the first day of the war and amounted to 20 per cent on the average in less than a week, according to Moody's index of 15 staples. This exceeds anything that occurred until after the first full year of the last war. However, the rise is obviously due to domestic influences, to anticipations, and to memory of the 1915-1920 rise rather than, so far, to actual war demands. The element of scarcity, prominent in the last war, is lacking. The first rise then was chiefly in food prices, and there is no scarcity of food in the world to-day, nor can be unless next year's crops are greatly reduced. The fact that nearly all countries are subsidizing agriculture because prices are too low is evidence of the plentiful supply.

Moreover, production can readily be increased in most agricultural commodities, in areas removed from the battlefields, and undoubtedly will be if prices tend to advance. Production of important staples has been restricted by international agreement, and there is room to step up output of these commodities as quickly as necessary. The production facilities of the whole world are vastly greater and more flexible than in 1914, and a far greater proportion lies outside the war zone. Present indications are that shipping facilities will be more adequate than in the last war.

Wheat in Chicago has risen 20 cents. In 1914, Russia was the chief shipper to Western Europe and the Russian supply was cut off. Now Russia is a minor factor in the wheat markets. Canada, Australia and the Argentine have doubled their pre-war production, and these three countries alone have a surplus for export and carry-over in 1939-40 of around 900,000,000 bushels, or half as much again as the world's entire import requirements last season.

Sugar had a violent advance upon the war news, but panic and unjustified hoarding pushed the rise to extremes. Actually the sugar supply is ample, and the panic was over even before President Roosevelt's action in abolishing the sugar quotas. What effect a long war might have on the sugar situation is unpredictable, but the position differs from 1914. The United Kingdom then depended heavily upon Continental beet sugar, but now uses hardly any, drawing on Cuba and her own possessions and dominions ; and production in many areas can be increased.

Hogs had a sharp rise of $2.50, and have since lost half of it. Estimates of inspected hog slaughter for next twelve months run around 47,000,000, compared with 40,000,000 in the preceding twelve months and 34,580,000 in 1937-8. Hides and wool have advanced around 50 per cent. The British Government has taken over the sale of the Australian wool clip, but how much will be available for this country, and at what price, is not yet known.

Restrictions on copper production abroad have been removed, so that Great Britain will supply her needs from African and Canadian producers whom she can pay in sterling. These mines plus those of the Belgian Congo may supply France also. The copper situation bears little resemblance to that in the last war, when the United States supplied 60 per cent of world production. Now we have about a third of the world's producing capacity, and domestic copper as a rule is a minor factor in the world markets.

Rationing and Price Controls

It is agreed that if the war lasts and fighting is active the belligerents will need more of many commodities than in the last war, that they realize their needs better than in August 1914, and that they may buy earlier. But they also know better that they must economize in their consumption and drive their own production hard. Before 1914 war was fought mainly by professional armies and in 1914 some believed it would be fought by professional armies again. The talk in England was of "business as usual," and an effort was made to maintain as "normal" business as possible, the word signifying a minimum of governmental interferences. But events soon proved that the whole population was involved, and that "business as usual" was impracticable. There is no pretense in the countries engaged that business will be as usual in this war. The industries will be concentrated on the production of goods for war, at the expense of every day consumption of other goods, and in order to give priority to armament needs imports are being subjected to license and consumers' goods are being rationed, in varying degrees, from the beginning.

All the countries engaged have had experience with war time inflation and all dread it. It is appalling that the national debts to be incurred for this war will be piled upon unpaid debts carried over from the last one, to which have been added the debts of the depression. Manifestly, no effort will be spared to control inflationary price tendencies, both to keep down costs and to ease the adjustments that will have to come after the war; and this leads, as it is already doing, to fixing prices, wages and hours, to restrictions on non-essential activities, and to further increases in taxes that are already almost insupportable. How effective the efforts may be only time can tell, but all appraisals of the outlook, including calculations as to commodity prices, will have to take the controls and the rationing into account.

World Prepared for War

This war has been expected and prepared for in all countries. The preparation has not only cushioned the shock, reduced the financial disturbance, and permitted markets to remain open which were closed in 1914, but it has simplified the changeover to war. German business has long been upon a war basis to a great extent, short of maintenance of the forces in the field and the destruction of material; and the democracies have moved in that direction to a degree which would have been deemed fantastic not many years ago. Business has been supported by armament expenditures, and exporters shipping to these countries have already been supplying war needs. War work has had priority, as if war were being waged. Labor and materials have been allocated to armament and reserve supplies accumulated. There has never been a like case where the step from peace to war was such a short one, and where the "war boom" to such an extent had preceded the war.

Moreover, the totalitarian countries have been striving to the utmost to increase their self-sufficiency, through development of synthetic and substitute materials, usually inferior or more expensive than the natural products, and through tariffs and quotas to stimulate their own production, usually uneconomical and at the expense of the standard of living. Other countries have had similar policies, and world trade has had to be adapted to them. These are adjustments to the war basis which in 1914 had to be made after the war started. The decline in the importance of international trade is shown by the League of Nations' calculation that although the industrial production of the world is 50 per cent above that of 1913, the volume of world trade is only 15 per cent greater. The disruption due to war is lessened by this growth of self-sufficiency.

The Foreign Trade Prospect

Will history repeat itself in a great expansion of the foreign trade of the United States, as in 1914-18 ? The rise in those years, partly due to higher prices, is shown in the following table :

U.S. FOREIGN TRADE (*In Millions of Dollars*)

Year	*Exports to Five Allies**	*Exports to Latin America*	*Total Exports*	*Total Imports*
1913	915	339	2,484	1,793
1914	931	258	2,114	1,789
1915	2,162	352	3,555	1,779
1916	3,554	531	5,483	2,392
1917	3,855	734	6,234	2,952
1918	3,656	728	6,149	3,031

*Great Britain, France, Italy, Russia, Belgium.

Though the net result in the years given was a tremendous gain, war cuts both ways in foreign trade. It will cut off almost all exports to Central Europe (the total to the present Germany, Poland and Danzig in the fiscal year 1939 was $135,000,000), and make shipments difficult to some other countries. It will reduce sales of some commodities to the Allies and certain neutrals, because of the controls upon imports and consumption and the abnormal strain on the normal means of payment for their purchases. On the other hand sales of war commodities will pick up greatly if the war lasts, and exports to countries which hitherto have bought from the combatants should improve.

Business in this country will move more soundly if it does not pitch expectations of trade with the belligerents too high. The situation differs from 1914 in significant ways. There is uncertainty as to what our neutrality laws will be, and their effect when they are promulgated. Mention has been made of the greater self-sufficiency of the warring countries, their preparations, and the wider sources of supply open to them.

Opportunities in Neutral Trade

In neutral countries the war will enlarge the opportunities open to our exporters, through the blockade of German and now also Polish trade overseas, and through the probable diversion of some British and French production from export to home uses. Nearly half of German merchandise exports, which amounted to Rm. 5,620,000,000 in 1938, will be affected by the blockade, most importantly those to Latin America, Africa and Asia. In view of the home needs it will likely be difficult for Germany to increase her exports to countries which she can still reach.

The United States looks forward principally to greater trade with Latin America. Some indications as to the extent of the opportunity may be had from the following table, showing the sources of import into Latin America.

IMPORTS OF 20 LATIN AMERICAN COUNTRIES IN 1937

(*In Millions of Dollars*)

	Imports from							
	U.S.	*U.K.*	*Germany*	*France*	*Italy*	*Japan*	*Others*	*Total*
Argentina	78	100	52	20	22	17	193	482
Brazil	76	40	79	8	5	5	118	331
Chile	26	10	23	2	2	2	23	88
Colombia	46	18	13	3	1	—	15	96
Peru	21	6	12	1	1	2	16	59
Uruguay	6	8	5	1	2	2	21	45
Venezuela	45	8	12	2	2	3	14	86
Mexico	106	8	27	6	2	3	18	170
Cuba	89	6	6	3	—	1	25	130
Others	62	11	23	3	2	11	32	144
Total	555	215	252	49	39	46	475	1,631
Per cent	34	13	16	3	3	3	28	100

The German trade may almost disappear, although shipments may be possible through Italy. In the last war the exports of the Allies to Latin America dropped off, though less than might have been expected. From 1913 to 1918 the decline in British exports to this area, in value, was about £10,000,000, or 20 per cent. Doubtless the Allies will make desperate efforts to maintain their exports in order to conserve their gold and foreign currency resources. Nevertheless, the market for American machinery and metal products, chemicals, coal and other goods should be enlarged.

The critical factor will be the ability of the Latin-American countries to keep up their purchases, which will depend upon their own export shipments. In the enthusiasm for developing exports the fundamental truth should not be overlooked that trade is a two-way exchange. If Argentine meats, grains, hides and wool, Cuban sugar, Chilean nitrates and other products are in greater demand at higher prices, as in the last war, producers of these things will buy more of other goods. But producers who have been selling important quantities to Germany, largely under barter arrangements, which is the case with Brazilian coffee and cotton, are losing markets. In the long run these countries cannot buy except as they sell, and conversely if the United States expects permanently to improve its exports to them it must arrange to admit more imports from them also.

The Inflationary Danger

In the long view the influences which may moderate the price rise and the trade boom in this country may be looked upon as an unmixed blessing. There are enough influences of the other kind to make the restraining factors welcome. The gravest danger that the war holds for the United States, apart from that of being drawn in, is the danger of a repetition of the vicious spiral of the last war in which prices, wages and living costs fruitlessly chased each other upward.

There is little fear, for the most part, that the price advances which have already occurred have, of themselves, made the business situation unstable, for they have been chiefly in raw materials and semi-manufactured goods dominated by raw materials. Raw materials in general were low relative to finished goods prices, and farm prices were low relative to prices of things farmers buy. Business is benefited by equitable price relationships, and the rise has been in that direction. In some commodities, where a larger production is now needed, the higher prices may be necessary to obtain it.

Nor can any great damage be done by intelligent and informed protection of requirements. However, miscalculations are made: and misinformation and misinterpretations get into circulation, and lead to an uninformed speculation which is a menace. There is a difference between intelligent foresight and such manifestations of fright or ignorance as food hoarding and indiscriminate speculative commitments.

Granted that war has a disturbing influence upon prices, the business community is vitally concerned in limiting this influence so far as possible, by counteracting it where this can be done. Attempts to make speculative profits by price advances based upon temporary and unsound conditions increase living costs and foster demands for higher wages, thus getting the whole economic situation on stilts, with collapse inevitable, as in 1920, 1929 and 1937. Business and labor have a common interest in protecting the stability of their working relations. The same self-restraint may be needed in considering new projects which temporarily may seem profitable, but in peacetime could not pay their way.

Business is concerned to safeguard its future against these dangers. Moreover, it must keep its own record clear. If it fails to curb excesses the Government will step in with controls, and possibly make mistakes of its own. Finally, the Government also should put its fiscal house in order. With improving business, need for relief should diminish. If the Government through deficit financing bids against rising private demands for labor and materials, an inflation of prices will result.

Undoubtedly the understanding of this danger is far more general than in 1914. Experience then was a hard teacher. An encouraging number of industries have extended current prices in the face of rising raw materials and of the virtual certainty that they could make price increases stick, at least temporarily. Reassurances as to supplies available have been publicly given, and panic and speculation allayed. The leaders have taken the longer view, knowing that if they discourage the boom they will save themselves from the reaction.

Domestic Business Conditions

Prior to the outbreak of war opinions were uncertain as to the first effect upon domestic business, but the answer was only a few hours in coming. Commodities rose at once as described, and after brief unsettlement stock prices jumped almost as sharply. This set the key for business. The flood of orders that reached the industries in the following days was immense, in some cases exceeding any like period on record: and industrial operations and freight movements turned upward sharply in response. Previous estimates of production levels for the next few months are now seen to have been hopelessly low, in view of this unforeseen change.

Business was moving into the Fall in an upward trend, and the elements of strength were impressive. Preparations against trade disorder had been made; distributors' commitments and stocks of goods and manufacturers' holdings of raw materials were low; production evidently was not outrunning consumption: there was underinvestment rather than overinvestment in capital goods; commodity prices were supported by various production controls and other measures: and Government spending continued at the peak.

These influences supported business against the war shock, and the memory of the export trade and the price rises of the last war provided the push upward. Almost over night business has gone off the hand-to-mouth basis, replenished inventories, and extended commitments. The war brought about the change, but the actual war business has not been the significant factor. Domestic orders have far outweighed the export orders, even where the latter have picked up most quickly, as in metal products and foods. Evidently business was ready to go ahead whenever any incentive appeared, or confidence was established. Probably it has been ready to do so at other times during the depression.

The Upturn in the Industries

At the beginning of September steel mill operations were running around 63 per cent of capacity: production, orders, and shipments were well balanced, and further moderate gains were expected to be maintained for a number of weeks in the Fall. However, orders during September have risen substantially above full capacity, and operations in the last week of the month were around 84 per cent. Most of the steel companies will apply present prices to deliveries through the end of year, but as scrap has risen $7 a ton to $23.25 in Pittsburgh, and pig iron $2 to $22.50, there is no assurance that prices will hold for the first quarter. This leads consumers to build up stocks, and the production rate is expected to move still higher.

Sales of cotton goods by mills in the Labor Day week were the heaviest on record, and during the month are estimated to have equalled four months' production. Goods prices and manufacturing margins have improved substantially. There was reason for this, for the mills have had a long and unprofitable period during which margins were the lowest in many years. Woolen goods business has been as large as the mills would accept, stimulated by the rise in raw wool and tops. Three times during the month goods lines were repriced, the toal markup amounting to 50 to 55 cents a yard on staple worsteds. The price of rayon yarn (viscose) is up two cents, and rayon goods are higher on active business. Silk has continued its sensational rise to above $3, despite the difficulty of determining wherein the war will reduce the production or increase the consumption of silk, and hosiery prices have had to be marked up again.

Now that conditions are better for the mills the two textile workers' unions have announced that they will move for a 20 per cent wage increase. But if this is granted, and not offset by greater productivity, the mills will have to have the present or higher prices and margins permanently, and probably the increase would start another rush of forward buying: in other words, it would be an element in the dreaded inflationary spiral. On the other hand, if the situation is left to resolve itself competition should hold down prices. There is no lack of raw cotton or spindles or looms to supply the country's needs, and experience shows that when prices and profits improve production rises until prices come down again. Probably the textile unions may not be impressed by this argument. They will say with apparent logic that when their employers make more money they should have more pay, but the question goes deeper, will the new prices hold, and are the mills making more than a fair profit? The danger is that if similar demands were made on all the industries, and all granted, costs and prices would rise to offset the higher money wages, and the increased pay would either be absorbed by the rise in the cost of living, or would result in unemployment due to the inability of people who were not receiving the higher wages to pay the higher prices. The experience of 1937, to say nothing of the last war, warns against allowing the upswing to become a "vicious circle." Both price and wage increases are charged with a public interest.

Sales Records Broken

Leather business has broken all records, with hides up 5½ cents, and shoe prices have been raised. Lumber sales have reached the highest level since 1930, and flour production is the highest in ten years. The rush in the wholesale foods business is described as the greatest ever known, with increased export demand for staple foods a factor. Paper business has been heavy, and prices are up in some grades, although newsprint quotations have been reaffirmed; the policy of the manufacturers is not to discourage demand, but to increase operations and employment. Tire replacement business has been stimulated, and factory schedules for the fourth quarter will be higher than previously estimated.

The automobile industry is contributing to the improvement, independent of the foreign situation, which may have an unfavorable effect by reducing exports of passenger cars. However, the rise in

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Britain's China Stake and the European War

IRVING S. FRIEDMAN, in Far Eastern Survey

The outbreak of the Sino-Japanese conflict two years ago brought about a major shift in the center of gravity of British interests in China. Britain's entry into a European war almost certainly will necessitate a further modification of her position—voluntary or involuntary. It is too early to say what the new policy will be, but it is clear that predictions based on the knowledge of the pre-1937-39 pattern of British interests in China can no longer be valid. Only by examining the major change which has taken place during the hostilities in China—which has been lost sight of in the welter of sensational "incidents" in the last two years—can Britain's present position, and possible points of departure in the future, be properly appreciated. This major change, in a word, has been the substitution of Rangoon in Burma for the coastal ports in China as the center for the economic penetration of the vast interior of China.

That Great Britain should have been the nation most affected by the hostilities in the Far East was only to be expected. Of all Western powers she has the largest economic stake in China. British interests have developed on the basis of entrepôt coastal centers which have owed their importance and their existence as separate entities to the vast hinterland. Boats, automobiles, railways and airplanes have been the means of penetration; and the rivers, canals, roads and railway lines which connect the ports with their markets, the essential arteries. The Japanese by their successive military drives in three main regions of China have been cutting these vital arteries. In the early part of the war British interests in China met the problem of forming new connections with the hinterland by using already established coastal centers for new purposes, or by vitalizing formerly obscure and unimportant Chinese ports. When, however, Japan's drive in South China followed by her blockade of China's coast made all these expedients insufficient, Britain was forced to seek an entrance to inland China outside the country.

North China Affected First

The transition from the traditional British position in China to the present one began with the outbreak of hostilities in North China in July 1937. The British interests in this area were the first to experience the effects of the disruption of normal relations between entrepôt and hinterland. Tientsin had become the most important trading port of North China largely owing to the construction of railways and the conservancy work in the Hai River, which facilitated the exploitation of the coal mines in the surrounding region, and to the promotion of wool trade with Mongolia. British interests in and around Tientsin cover many fields of activity, including coal mining, banking and manufacturing, and especially trade. The total value of British municipal and private property in Tientsin is estimated at £10 million, and another £25 million is invested in business interests in North China generally. The trading connections and business organizations built up by British firms in the eighty years since the opening of the city would alone insure the British a substantial share in the development of the Tientsin area, provided, of course, that the open door were maintained.

This last proviso is the key to the situation. The railway lines which radiate from Tientsin and Peking—the most important being the Tientsin-Pukow and the Peking-Hankow lines—are the main links between Tientsin and the interior. The Japanese have been using their control over these communications as an effective weapon in squeezing British interests out of North China. The fact that British Bondholders have large interests in these railways has granted the British no immunity from discriminatory steps. These acts alone would weaken the British position, but to them has been added the establishment of monopolies, export prohibitions, exchange control regulations, tariff revisions favorable to Japanese products, and inefficient telegraph service. The present blockade of the concession even threatens the existence of the concession itself. In short, at least until the time of this writing, the Japanese are at the same time attempting to monopolize Tientsin's hinterland and are undermining Britain's power in North China at its most vulnerable point.

Japanese Shipping Displaces British

Although available statistics indicate that the total value of trade between Tientsin and Great Britain has increased during the present hostilities, the Japanese gain has been incomparably greater. The British increase, moreover, was not absolute and must be seen in the light of the closing of other ports, rerouting of intercoastal trade, and rising prices. Tsingtao, formerly an important center for British trade in North China, is now practically closed to British trade and the important bristle export transactions formerly enjoyed by Tsingtao now go through Tientsin. Cotton exports that under ordinary circumstances would have gone down to Hankow or Shanghai have, owing to military operations in the Yangtze Valley, been finding their way north to Tientsin. The total tonnage of British shipping (entering and clearing) in the port of Tientsin last year was greater than in 1937 and 1936, but the Japanese flag has displaced the British from first place.

Two of the largest British enterprises in North China, however, escaped the fate of most British trading concerns in this area. The Kailan Mining Administration and the British-American Tobacco Company both supply commodities of which the Japanese are in need, and both have attempted to make their peace with the Japanese. The former has not only decided to increase its coal output from 5,500,000 to 6,500,000 tons to meet increasing demands from the Japanese but has also expanded its activities by Ch.$10,000,000 worth of debentures issued in London in December 1938. The *Japan Times* pointed to this as evidence of "British diplomacy based on reality."

The British-American Tobacco Company, which has extensive interests outside as well as inside North China, has also done quite well during the present hostilities, but it faces the prospect of increased Japanese competition. Its profits for 1938 amounted to £5,500,886, which was £169,563 less than that earned in 1937 but somewhat more than the sum earned in 1936. The apparent decrease in 1938, moreover, was due to increased taxation. Sir Hugo Cunliffe-Owen, chairman of the company, has expressed confidence in the future provided "we enjoy only reasonable stability in world affairs and provided we also enjoy equal opportunities with our competitors." But the experiences of the B.A.T. and the Kailan Mining Administration must be regarded as exceptional; both organizations are able to profit from what is denied to the other British interests in North China—unbroken connections between the chief ports and the interior and freedom from discriminatory activities.

Large Losses in Shanghai

The story of British interests in Tientsin and North China was repeated in Shanghai and the Yangtze Valley. Only in the latter area the take was much larger. The Yangtze Valley has always constituted the chief sphere of British interest in all of China, and Shanghai is its chief port. British investments in this city alone were estimated at approximately £180,000,000, or about 60% of total British investments in China at the beginning of the hostilities in 1937. The losses to British interests in Shanghai as a result of more than a year's isolation from the interior were computed in October 1938 to be between £5,000,000 and £6,500,000, as contrasted with an estimated decline in the value of British investments in all China of over £120,000,000. Shanghai's isolation was achieved by Japanese control of the chief arteries which connect the port and the interior—the Yangtze River and the Shanghai-Nanking and the Shanghai-Hangchow-Ningpo railways.

Yangtze shipping, which before the outbreak of hostilities, had practically been a Sino-British monopoly, had carried goods as far west as Szechuen. As long as the Yangtze was the scene of large-scale hostilities, British business circles in Shanghai accepted the arguments of "military necessity" and solicitude for the welfare of foreign shipping as valid reasons for the closure of the river to foreign merchant vessels. But as it became increasingly evident during 1938 that Japanese merchant vessels were doing what had been forbidden to British vessels, that tens of thousands of tons of exports and imports were passing up and down the lower Yangtze under Japanese auspices and for Japanese accounts, that the cargoes were not war supplies but rather such commodities as sandalwood, silkwaste, piece goods, candles, soap and cigarettes, and that booking offices in Shanghai were soliciting passengers and freight and offering to secure military passes, British trading circles in Shanghai became convinced that Japan intended to maintain a monopoly over the biggest domestic market in China. Sir Robert Calder-Marshall, chairman of the British Chamber of Commerce of Shanghai, expressed the concern of the British business community: "The monopolization of the inland water transportation by the Japanese has an important effect upon British trade as it places all Chinese inland water transport under Japanese control and is thus in a position to apply discriminatory measures, while of course, it is in direct contravention of treaty rights enjoyed by British."

Similarly the British no longer accept the Japanese plea of military necessity in the case of Shanghai's rail connections. The Japanese have not only been operating the Shanghai-Nanking Railway and the Shanghai-Hangchow section of the Shanghai-Hangchow-Ningpo Railway. They have installed a system of military passes and permit other travellers to use the line only under the closest restrictions. Moreover, it is claimed that the Japanese have persistently refused to allow the representatives of the bondholders, chiefly British, to exercise any of their legal rights in the management of the line or to inspect it; that they have continued to operate the railway in violation of the terms of the loan agreement, and have appropriated the revenue which legally belongs to the bondholders; and that they have formed a company, the Central China Railway Company, with capital said to be subscribed by the Japanese Government and Japanese interests, and the Nanking "Reformed Government" in equal shares, to operate these lines. The Chinese Government, it should be added, has declared its inability to accept responsibility for the obligations of the railways which have fallen into Japanese hands. The loan services are now in default and the Shanghai-Nanking Railway is already £1,392,000 in arrears and the Shanghai-Hangchow-Ningpo Railway £66,000.

Of course not all British interests in Shanghai have been adversely affected by the war. A boom in local business, building construction and industrial activity arising out of currency depreciation and an influx of hundreds of thousands of refugees, has somewhat mitigated the effect of the "peaceful siege." Thus many British firms, including the Hongkong and Shanghai Banking Corporation, the Ewo Cotton Mills, the largest textile factory in China, and the Shanghai Waterworks Company, made considerable profits during 1938. This aspect of the situation has been treated in some detail in earlier reports in this journal.

Character of Trade Altered

While the boom has succeeded in reversing the downward trend in the volume of Shanghai's trade, however, it has not fundamentally affected the changes in the character of the trade brought about by barring British commercial shipping from the Yangtze and by restricting the uses of the railways. With access to the raw materials of Central China gone, Shanghai not only has lost a profitable export trade but must even import the same commodities from elsewhere to supply its own needs. Thus manufactured products have taken on a new importance in Shanghai's export trade while, conversely, raw materials have taken on a new importance in her import trade. For example, imports of cotton piece goods from foreign countries have declined but imports of raw cotton are rising sharply. The latter trend comes as a direct response to the reopening of the mills in Shanghai, the large export of North China cotton to Japan, restrictions on shipments to Shanghai, and the closure of the Yangtze which has compelled the Shanghai mills to purchase foreign cotton. Shipments of vegetable oil, tallow and wax constituted in 1936 and 1937 the main group of Shanghai's exports, but during the first six months of 1939 the export of these commodities was valued at Ch.$2,007,136 compared with Ch.$3,602,243 for the corresponding period in 1938 and Ch.$44,306,045 for the same period in 1937. Piece goods exports, on the other hand, totalled Ch.$13,862,504 for January-June 1939, compared with Ch.$7,067,487 for the corresponding period in 1938.

The separation of Shanghai from the interior has also seriously affected the volume of its trade as well as its nature. Only 30% of China's trade passed through Shanghai during 1938 as against over 50% under normal conditions. Shanghai's total foreign trade in 1938 (Ch.$491,273,386) declined by some 46% as compared either with 1937 or 1936. The total value of foreign imports into Shanghai decreased by more than half between 1936 and 1938 and imports from Great Britain declined about 57%. Similar declines were seen in the value of exports. The downward trend was reversed in 1939 as a result of the boom just mentioned. Both in imports and exports, Shanghai's trade for the first six months of 1939 more than doubled as compared with the corresponding figure for 1938. Trade with Great Britain has markedly increased, although not as much as that with Japan and the United States. It now remains to be seen whether the outbreak of the European war will seriously affect this revival.

Coastal Shipping Killed

The decline in Shanghai's coastwise trade even more clearly reflects the effects of Shanghai's isolation. Coastwise imports of Chinese merchandise were valued at Ch.$237,700,000 in 1938 as against Ch.$436,500,000 in 1937, and coastwise exports at Ch.$319,000,000 as compared with Ch.$434,500,000 in the earlier year. Moreover, the latest Japanese blockade of the coastal ports threatens what remains of the coastwise trade. Until the instituting of this blockade, Shanghai had carried on a brisk trade with the Chekiang ports of Ningpo and Wenchow. Since the closure of the Yangtze both of these ports had served as centers through which considerable tonnage of export products from the Chinese-controlled areas reached Shanghai and through which products of Shanghai moved to interior China over combination highway-rail routes. This trade has now ceased.

Shanghai's shipping—overseas, coastal and inland—has reflected trade conditions. The total tonnage entered at Shanghai during the year 1938 was 9,742,768 tons—a sharp decline from the 13,254,437 tons in 1937 and 18,826,779 tons in 1936. However, while in overseas shipping the totals for 1938 of 1,150 vessels and 5,250,874 tons were only slightly less than the figures for 1937, in coastal shipping the totals for 1938 (2,712 vessels and 1,737,495 tons) came to less than half of those for 1937. British shipping showed similar changes. British entries from abroad into Shanghai in 1938 amounted to 2,429,278 tons, which compared favorably with the 1,841,249 tons in 1937 and with the 2,615,839 tons in 1936. British entries from Chinese ports, on the other hand, have steadily declined from 2,977,964 tons in 1936 to 1,443,722 tons in 1938, primarily because of the closure of the Yangtze River. By restricting the use of Chinese ports the Japanese have attacked the last remaining important coastal centers which gave the British contact with the hinterland of Central China. At least one thing is certain: the "prosperity" which the British in Shanghai are enjoying at present is not based on durable factors such as trade with the interior or coastal shipping. Only the restoration of the former connections with the hinterland could restore the British in Shanghai and throughout Central China to their former outstanding position.

Hankow Also Cut Off

In Central China, Hankow, 600 miles up the river from Shanghai, has been the main center of British interest in the interior. This city served as the chief feeder and outpost of Shanghai until the booms were laid across the Yangtze at Kiangyin in August 1937. Then recourse was had to the recently completed Canton-Hankow Railway. The extensive use of this railway for government supplies, however, limited the importation of general merchandise from the coast to comparatively minor quantities, not to speak of the risks and delays *en route* caused by continuous Japanese bombardments. The net result was what might have been expected. Finally, as the Japanese military forces approached the Wuhan cities, factories, shops and people began a general evacuation and since the arrival of Japanese forces on October 26, 1938, there has been a complete stagnation of business. Here, even more than in Shanghai, the *sine qua non* of a revival of British trade is the opening of the Yangtze to British shipping.

Until the completion of the Canton-Hankow Railway in 1936, the commercial hinterland of Hongkong and Canton had been limited to Kwangtung and Kwangsi. These provinces are served by the rivers flowing south and east from the mountains which form the watershed between these rivers and the tributaries of the Yangtze, and provide a market of some fifty million people. The chief characteristic of Hongkong's trade has always been its enterpôt character. There was a time when Hongkong handled and financed about 40% of all China's foreign trade. Since the beginning of the 20th century Shanghai has come to the forefront, but even so Hongkong continued up to 1936 to handle approximately a quarter of China's foreign trade. Not more than one tenth of her imports was consumed in the Colony, and about the same proportion of exports was of local origin.

Hongkong First Replaces Shanghai

The outbreak of hostilities brought an upturn in business to Hongkong. For the first eight months of 1938, the Colony's visible trade was 15% greater than for the same period of 1937; and 58% greater than for the same period of 1936. Part of this increase was due to a brisk munitions trade, but more important was the diversion of trade, which formerly used to reach the interior up the Yangtze via Shanghai but which could now be transported via the Canton-Hankow Railway. Thus, for example, Hongkong replaced Shanghai as the tea export center of China. While the total trade of the Colony from January to August 1938 was showing an increase of over Hk.$98 million compared with the corresponding period of 1937, Shanghai's total for these months had declined by Hk.$504 million. Thus, Hongkong's gain was only a small fraction of Shanghai's loss.

In addition to the increased business resulting from the diversion of trade, the Colony benefited considerably by an influx of well-to-do refugees and the establishment of numerous manufacturing and other activities formerly carried on in Shanghai and other cities affected by the hostilities. For example, it was authoritatively reported in September 1938 that six big factories were to be erected in Kowloon by Shanghai Chinese industrialists—including a synthetic nitrogen products factory, an electro-chemical factory, a satin-weaving plant, and an advertising and printing establishment. Local industries like shipbuilding and ship repairing experienced unprecedented activity.

In contrast with the general boom, Hongkong's shipping during 1938 suffered the worst setback in twenty years. The total number of ships entering and clearing was 67,007 with a total tonnage of 30,962,756, representing a decrease as contrasted with the 1937 figure of 73,257 vessels with a total tonnage of 37,830,736. This decline was mainly in foreign shipping. The hostilities were responsible for the shipping slump. Chinese shipping had completely ceased and Japanese shipping had greatly decreased. British ocean-going shipping likewise showed a decrease of 326 in numbers with a decrease of 312,456 tons. The river-steamer trade also declined but British river steamers benefiting by Hongkong's increased trade with South China ports increased by 276 vessels, and 402,207 tons. For example, two additional vessels were put on the Hongkong to Macao service.

The Japanese invasion of South China which resulted in the capture of Canton on October 21, 1938, checked the Colony's business uptrend. For the Pearl River, chief connection between Hongkong and Canton, was closed to British shipping and the Canton-Hankow Railway ceased to serve as a carrier of goods to and from Hongkong. Hongkong had now lost her direct contacts with South and Central China. *Finance and Commerce* gloomily commented on the new situation: "With the keys of Canton in her hands, along with those of the Yangtze Valley and North China, Japan will be in a position to strangle or to stimulate the foreign trade upon which Hongkong, Shanghai, and Tientsin depend."

War Boom Only a Veneer

Hongkong's silver lining may rightly be classed with that of Shanghai. Bolstered up by increased population and by the establishment of new, though inadequate, connections with the hinterland the city has been so able to adjust itself to the new situation that practically all lines of business continue to operate at capacity with the exception of insurance. The Chinese ports of Pakhoi and Kwangchowwan, the French Indo-Chinese port of Haiphong and the Portuguese colony of Macao have taken on new importance and through them Chinese products of various categories still find their way to Hongkong for transhipment, despite the disruption of normal transportation routes. Goods filter into the interior by all sorts of devious ways and means. Macao, for example, which for over ninety years had steadily declined in commercial importance, has now become a busy trading center. Hongkong's trade has fallen but its condition is not unfavorable when compared with that in corresponding periods of 1936 and 1937, rather than with the extraordinary boom of 1938. Nevertheless, although the British in Hongkong might congratulate themselves on the ability of the Colony to "carry on reasonably well under the present conditions of restricted trade," the fundamental weakness of the present position must be recognized. For as long as the Pearl River remains closed to British shipping and the Japanese control the termini of the Canton-Hankow Railway, Hongkong, like Shanghai and Tientsin, is cut off from its traditional hinterland.

In addition Hongkong's position has been changed in another direction. With the recent strengthening of its fortifications, it has become an important fortress. Together with Singapore it has the task of safeguarding British trade routes in the Far East and, although its economic position as the entrepôt for South China may decline, its strategic importance has become of primary consideration with the outbreak of war in Europe. Moreover, the maintenance of a large garrison and the erection of fortifications have been acting as buffers against the effects of Hongkong's growing isolation.

Rangoon the New Center

The British interests which can no longer penetrate China's interior from various points on her long coast are now in the process of establishing a new center to accomplish this end. Rangoon, in Burma, has become the back door through which British interests have been trying not only to re-establish contact with the central and western parts of China but also to participate in the building of the new China which the Nationalist Government is creating in the South-west. Interest in the potentialities of this region as a market for British commodities, especially capital goods like railway supplies, and as a field for profitable investment became keen after the fall of Canton and the capture of Hankow. The bright prospects for the British in unoccupied China contrasted sharply with the gloomy future facing the established interests in the coastal region.

Aid to the Nationalist Government has become synonymous with the strengthening of the British economic position in unoccupied China. Participation in the construction of the already completed Yunnan-Burma highway; the provision of £5,000,000 to help establish a currency stabilization fund which would bolster British trade with Nationalist China; the commencement of the Sino-British undertaking to connect by rail Yunnanfu, capital of Yunnan and projected railway center of South-west China, with Rangoon; the £500,000 export credit loan which will be used for the guaranteeing of British exports to South-west China by the Exports Credits Department of the British Treasury; and the use of remitted British Boxer Indemnity funds to purchase telephone, telegraph and railway equipment—all these indicate that the British have begun to participate actively in the reconstruction of Nationalist China. This has been encouraged by the leaders of Nationalist China, who have repeatedly stated that they not only welcome investments in wartime which do not infringe upon China's sovereign rights but welcome even more aid "in tackling the still greater problems of economic rehabilitation that will follow in the wake of hostilities."

It remains to be seen what effect the European war will have on British interests in China, particularly as they have been altered in the last two years. Will the British now come to some agreement satisfactory to the Japanese which would entail giving up their newly acquired gains and prospects in South-west China? Will they attempt to hasten the exploitation of the resources of the new Nationalist China as a means of increasing available supplies of such valuable war commodities as tungsten, antimony, mercury and tin in spite of possible increased Japanese pressure against their interests in the coastal region? Will they continue their present policy of retreating and making the best of the immediate situation in the occupied territory, while attempting to profit by the reconstruction now going on in the unoccupied territory? The answers to these questions lie in future developments. The war in Europe has altered not only Britain's position in China but Japan's position *vis-à-vis* the West. An interesting and significant period is about to unfold.

Japan's Foreign Trade in Wartime

By *W. HARVEY CLARKE, Jr.*

The year 1937 was outstanding in the annals of Japan's foreign trade value: for during its course an all-time high record of Y3,200,000,000 was set in exports and Y3,800,000,000 in imports. The country's foreign trade had mounted steadily from a low record in 1931, reaching its peak in 1937.

Under wartime conditions in 1938, exports fell to Y2,680,000,000 and imports to Y2,660,000,000. Pure exports to third countries last year dropped to Y1,520,000,000 from Y2,380,000,000 in the preceding year, and pure imports from third countries fell from Y3,340,000,000 in 1937 to Y2,090,000,000, the ratio of decline being 36 per cent in the former and 37 per cent in the latter case.

The question is why did trade with third countries slump so inordinately? Imports did not drop naturally but due to severe restrictions imposed by the government by means of exchange control regulations. When exports increased and the resulting ability to import was expanded, a minimum of restrictions would have tended to increase imports. But, instead, curbs on imports operated to depress the export trade.

Japanese exports to third countries fell off because with the country at war increased demands were placed upon her economic structure. Various objective circumstances arose with a fresh demand for munitions and other commodities. Raw materials, manufacturing facilities and the labor essential for the production of commodities were transferred from normal channels. As a result, the export surplus dropped sharply from the level of the pre-war period.

Since the outbreak of the China Incident, Japan has placed restrictions upon exports of iron, coal, motor-cars and accessories, rabbit skins and a long list of other articles. Thus, the limited supply of commodities available for export due to insufficient raw materials and manufacturing facilities, as well as a shortage of labor to produce export articles are the principal causes for the depressed export trade. Another reason for the recession of exports is the rise in prices of export articles.

The drastic fall of exports in Japan during 1938 was attributable, also, to special causes other than wartime factors, a shortage of commodities and an advance in prices. The first was the fact that the world as a whole was more prosperous in 1937 than last year. The world's total exports in 1938 fell by about ten per cent from 1937 figures, according to a survey by the League of Nations. It may be said, therefore, that the slump in Japan's export trade in 1938 was caused to the extent of ten per cent by conditions throughout the world.

The second special reason was the anti-Japanese boycotting campaigns conducted in overseas markets, especially in the South Sea region (by Chinese merchants) and in the United States. In such markets as the Straits Settlements, French Indo-China, Siam, the Philippines and the Dutch East Indies, Chinese merchants are extremely influential in governing import trade and domestic sales. With these merchants staging anti-Japanese boycott movements, Japanese exports to these destinations shrank enormously, dropping by 70 per cent to the Stratis Settlements and by 50 per cent to the Philippines, compared with 1937.

Anti-Japanese boycott campaigns in the United States were not so systematized as in the South Sea region. The aggravation of public sentiment in the United States toward Japan since the beginning of the China Incident was deep-rooted enough to affect trade relations between the two countries, causing Japan's exports to America in 1938 to decline by about 40 per cent from 1937.

To promote Japan's export trade under wartime conditions the foregoing factors need to be eliminated. Japan at present has to expand her export trade in order to increase her importing ability. This means that the necessary raw materials must be available for military and industrial production activity. The government and business could well co-operate in an effort to overcome the major difficulties at hand.

Owing to the insufficient supply of commodities, Japan should strive to stabilize as much as possible the production of export articles. A ban on the manufacturing of pure cotton articles in Japan was placed for this purpose. Adoption of the link system and establishment of the Export Raw Material Distribution Company also represent efforts to this end.

In coping with the advance of commodity prices, the government established the Central Price Control Commission, in Tokyo, and local price control committees in the various prefectures to fix official prices for groups of commodities in an effort to check rising prices at home. The committees are producing results in preventing the rise of prices from present levels.

Apparently little can be done to counteract depressing conditions throughout the world, and it seems that the boycott movements will have to die a natural death.

During the first seven months of the current year, from January to July, inclusive, Japan's total exports were valued at Y1,762,000,000, an increase of 24.8 per cent over exports in the corresponding period last year, which amounted to Y1,412,000,000. These seven-month shipments may be divided into exports to yen-bloc markets totalling Y884,000,000, an advance of 43.3 per cent, or Y617,000,000, over a year ago, and exports to third-country markets (termed pure exports) totalling Y877,000,000, up 10.4 per cent over a year ago.

Exports to yen-bloc countries have continued to rise sharply, while those to third countries have gained more than ten per cent. The increase in exports to yen-bloc destinations indicates the progress of industrial expansion in Manchoukuo, the reconstruction programs in China and pacification endeavors in Japan-occupied parts of China. Yet, too great an increase in exports to yen-bloc countries may affect shipments to third countries because of the restricted supply of raw materials, manufacturing facilities and labor.

Among Japanese commodities exported to third countries during the first seven months of 1939, the following items were outstanding:

Commodity	*January-July Export Increase Over Same Period in 1938*
Cotton Tissues	16 per cent
Cotton Yarn	130 per cent
Rayon Yarn	52 per cent
Marine Products	95 per cent

Shipments of machinery and tools during the first six months of 1939 receded by 62 per cent, while those of silk tissues dropped by 23 per cent from a year ago.

Classified by markets, Japanese exports in the first six months of 1939 advanced by 20 per cent to the United States, 17 per cent to British India, 27 per cent to the Dutch East Indies and 47 per cent to Germany. Exports in the first half of this year dropped by 89 per cent to Argentina, 40 per cent to Siam and 38 per cent to the Philippines from a year ago.

Exports of Cotton Tissues

The export of cotton tissues from Japan during the first half of the current year was marked with the merits and demerits of the "link system."

From January to June, inclusive, cotton tissue exports totalled 1,116,000,000 square yards valued at Y182,890,000, representing an increase in volume of 22,735,000 square yards but a decrease in value amounting to Y37,660,000, compared with exports in the corresponding period of 1938, according to a survey by the Japanese Finance Ministry.

It is common knowledge that shipments of cotton tissues to yen-bloc markets have been suspended since July, 1938, when the link system was put into operation.

However, pure exports to third countries during the first half of this year gained by 290,180,000 square yards, or 34.7 per cent, over exports in the first half of 1938. But the value of these shipments did not make so noteworthy a gain as the volume, increasing by only 15.8 per cent.

The net results of cotton tissue exports to third countries during the first half of the past three years, from 1937 to 1939, is indicated below:

EXPORTS OF COTTON TISSUES TO THIRD COUNTRIES

(In 10,000 square yards)

	1st half 1937	*1st half 1938*	*1st half 1939*
Yen-bloc	20,203	28,879	2,134
Third countries	105,791	80,465	109,484
Total	125,994	109,344	111.618

EXPORTS OF COTTON TISSUES TO THIRD COUNTRIES

(In Y1,000)

	1st half 1937	*1st half 1938*	*1st half 1939*
Yen-bloc	49,513	71,108	9,803
Third countries	219,940	149,446	173,090
Total	269.453	220,554	182,893

The unit export price, which has been declining steadily since the link system was adopted in Japan last year, dropped to the record low of 15.79 sen per square yard in March of this year. This price began to gain in April, rising to an average of 17.52 sen in May, but it receded again in June to 16.13 sen. Domestic spinning companies, for a long time boastful of their big profits, have begun to report losses, asserting that such could be checked if exports were curbed. Consequently, larger stocks of cotton tissues are piling up. In view of the abnormal condition, the Finance Ministry and the president of the Japan Cotton Spinners' Association went into discussion about adequate measures to cope with the situation. Unit export prices have fluctuated as follows:

FLUCTUATIONS OF UNIT EXPORT PRICES

(In sen per sq. yard)

Year and Month	*Grey*	*Bleached*	*Finished*	*Average*
November, 1938	13.42	15.22	20.39	16.78
January, 1939	13.31	15.39	19.27	16.35
March, 1939	12.67	16.05	18.81	15.79
April, 1939	13.02	15.48	20.02	16.71
May, 1939	13.71	15.95	20.61	17.52
June, 1939	12.64	14.65	19.29	16.13

Yet, all domestic spinning concerns are not burdened with accumulated stocks. Some of the companies have shown earnings due to their having specialized more in exporting finished articles (such as dyed or printed materials) than in unfinished goods (such as grey or bleached materials). When the link system was put into effect, exports of grey and bleached items led the field, but within recent months finished articles have regained lost ground. The following table shows results:

EXPORTS OF COTTON TISSUES CLASSIFIED

Years	*Exports Percentage of Total Exports*		
	Grey	*Bleached*	*Finished**
1937 whole year	30.65%	14.53%	44.81
1938 first half	37.69	25.08	37.22
1938 third quarter	41.77	21.56	36.67
1939 January	37.26	18.31	44.43
March	40.37	19.56	40.05
April	33.92	20.56	45.51
May	30.52	21.01	48.46
June	32.64	20.87	46.48

* Including dyed, yarn-dyed and printed tissues.

It will be noted in exports for the first half of the year that shipments to the Asiatic markets mounted considerably, except to the Philippines. Among Asiatic destinations, yen-bloc countries, such as Manchoukuo, China and Kwantung, are excluded.

This gain may be attributed to the cessation of anti-Japanese boycotting by Chinese merchants in the Asiatic markets since the fall of the Chiang Kai-shek regime.

Of the exports to continental markets, a rise in shipments to Hongkong is significant. It is believed that Japanese cotton tissues imported by Hongkong are usually re-manufactured there and exported elsewhere. Shipments to British India and the Netherland Indies have also advanced, as well as to Kenya, Uganda, Tanganyiki and South Africa. Increasing shipments to these destinations points to the greater saleability of Japanese articles over Indian or British articles in these markets.

A marked drop featured exports to Argentina, which took only 3,930,000 square yards during the first half of this year, compared with 46,200,000 square yards in the first six months of 1938, this year's export volume amounting to only 8.5 per cent of last year's. This is accountable to the import checking tendency resulting from a more stringent exchange control in Japan since the close of 1938. Naturally, no appreciable increase in future shipments to Argentina can be expected.

"Out of the Horse's Mouth"

(Continued from page 445)

an effort is being made to establish control in Japan's own interest, of large areas on the continent of Asia and to impose upon those areas a system of closed economy. It is this thought, added to the effect of the bombings, the indignities, the manifold interference with American rights, that accounts for the attitude of the American people toward Japan to-day. For my part, I will say this. It is my belief, and the belief of the American Government and people, that the many things injurious to the United States which have been done and are being done by Japanese agencies are wholly needless. We believe that real security and stability in the Far East could be attained without running counter to any American rights whatsoever.

Mr. Chairman, Ladies and Gentlemen: I have tried to give an accurate interpretation of American public opinion, most carefully studied and analysed by me while at home. The traditional friendship between our two nations is far too precious a thing to be either inadvertently or deliberately impaired. It seems to me logical that from every point of view—economic, financial, commercial, in the interests of business, travel, science, culture and sentiment—Japan and the United States forever should be mutually considerate friends. In the family of nations, as between and among brothers, there arise inevitable controversies, but again and again the United States has demonstrated its practical sympathy and desire to be helpful toward Japan in difficult times and moments, its admiration of Japan's achievements, its earnest desire for mutually helpful relations.

Personal Motives

Please do not misconstrue or misinterpret the attitude which has prompted me to speak in the utmost frankness to-day. I am moved first of all by love of my own country and my devotion to its interest; but I am also moved by very deep affection for Japan and by sincere conviction that the real interests, the fundamental and abiding interests of both countries, all for harmony of thought and action in our relationships. Those who know my sentiments for Japan, developed in happy contacts during the seven years in which I have lived here among you, will realize, I am sure, that my words and my actions are those of a true friend.

One Japanese newspaper queried, on my return from America, whether I had concealed in my bosom a dagger or a dove. Let me answer that query. I have nothing concealed in my bosom except the desire to work with all my mind, with all my heart and with all my strength for Japanese-American friendship.

To-day I have stated certain facts, straightforwardly and objectively. But I am also making a plea for sympathetic understanding in the interests of the old, enduring friendship between our two great nations. In a world of chaos I plead for stability, now and in the long future, in a relationship which, if it can be preserved, can bring only good to Japan and to the United States of America.

Gas in China

By *WALTER T. DUNN*, M.I.Mech.E.

THE following particulars of the property of the Hongkong and China Gas Company and of other gas undertakings operating in China, are contributed by the writer through the courtesy of Messrs. West's Gas Improvement Company, of Albion Ironworks, Miles Platting, Manchester. A portion of it appeared in "West's Gas," the house organ of that Company, and the blocks from which Figs. 2 and 3 are printed have been kindly lent by that well-known firm of gas engineering contractors.

Introducing the subject under the title—"Gas in China—Progress under Western and Japanese Influence," acknowledgment is made by the firm of the assistance in compiling it of Mr. Robert H. Glen, Chairman and Managing Director of the Hongkong and China Gas Company; and of other authorities.

The geographical China, rather than the somewhat uncertain political entity as it stands at the present moment is referred to. In other words, Manchuria, Korea and Hongkong are included in the area with which an attempt is made to deal. A map of China, Manchuria and of Korea, showing the towns in which gas service has been established is given in.

There is no very precise information to be obtained in any single publication about the gas industry in China, but it may be taken that gas undertakings are confined to the relatively few towns and cities which have come under Western or Japanese influence. In China proper perhaps Shanghai possesses the largest gas undertaking. It is administered from London, and owned by the Shanghai Gas Company, Limited, the offices of which are at 656 Yu Ya Ching Road, Shanghai, China.

The demand for gas at Shanghai reached 2½ million cubic feet per 24 hours in the winter of 1931-32. The latest returns given by Mr. W. J. Baker, Engineer-in-Chief and Manager at Shanghai, show that the make is 975 million cubic feet for the year: that the calorific value is 500; and that the number of consumers is 12,630. The writer had the privilege of visiting these works during a tour of the Far East, and was much impressed by what he saw. He described the new works of the Company in *The Far Eastern Review* of June, 1934, the article being fully illustrated.

At the Annual Meeting of the Institution of Gas Engineers, held in London in June 1936, Mr. Baker presented a Paper dealing with the latest considerations at Shanghai from the gas engineer's point of view. In it he stated that the Company, realizing that its existing works was in 1930 approaching the end of a useful life, decided to build new Works on a new site. The scheme finally adopted allowed for a new manufacturing plant on a site 160-ft. wide and 1,425-ft. long. with a high-pressure pipe line connecting the new plant to the existing gasholders, about six and a half miles distant.

The site purchased was a swamp, which had been reclaimed from the river in 1919. The complete plant and buildings were carried on piled foundations, the entire load being taken by skin-friction on their surface. In view of the high cost and the uncertainty of Chinese labor, it was decided to install mechanical coal-handling plant, vertical retort plant, and mechanical coke-handling and screening plant.

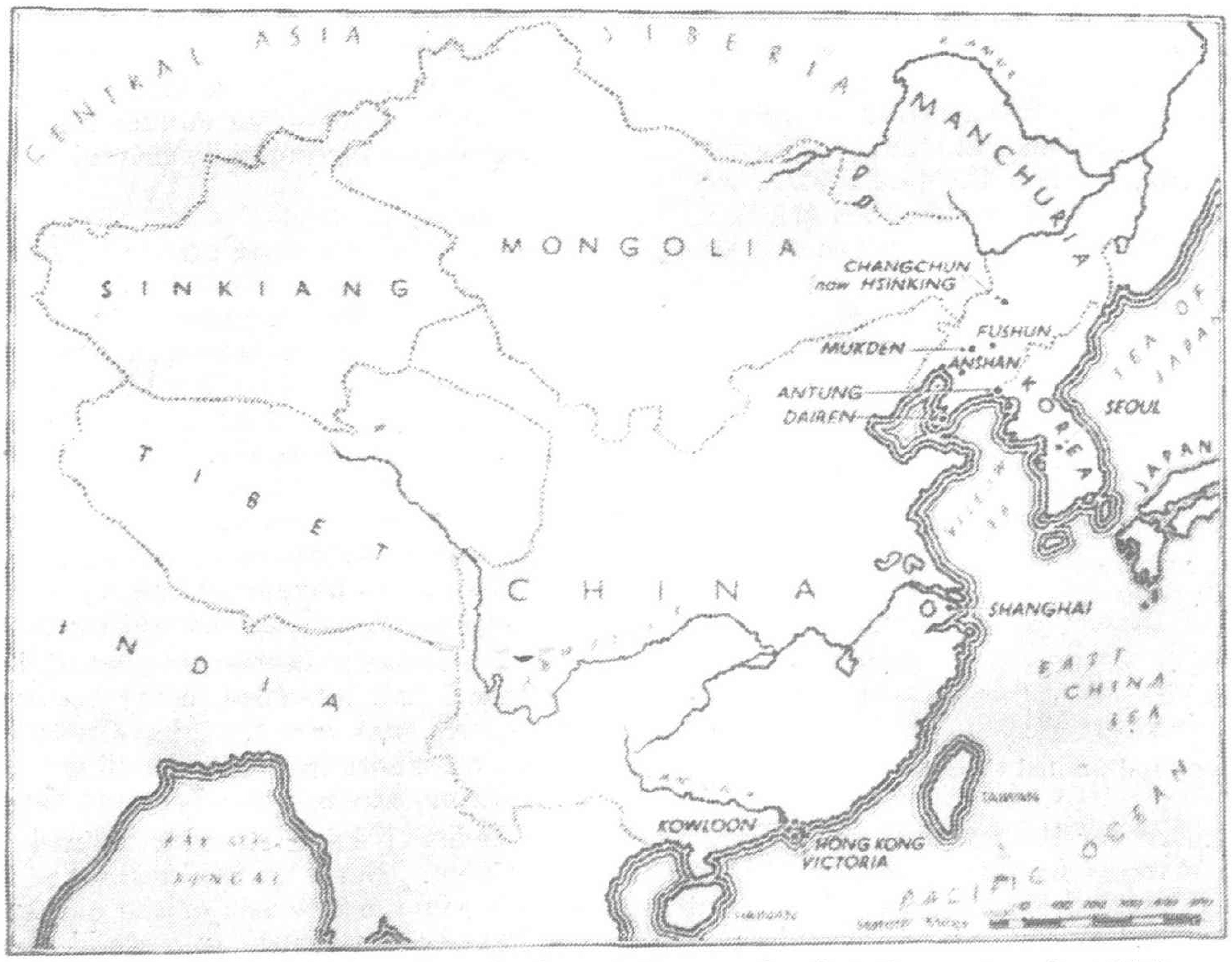


Fig. 1.—Map of China, Manchuria and Korea, showing the centers in which gas service has been established

The coal for the Shanghai Gas Works is usually purchased from Japan in consignments of 2,000 to 3,000 tons, and the coal storage was designed to accommodate 5,500 tons. Two jigging screens for the coke enable it to be graded into four distinct sizes. The carbonizing plant consists of upwardly-heated continuous vertical retorts, capable of producing four million cubic feet of gas per day, with external producers designed to use breeze fuel. The water-gas plant is provided only as a stand-by, owing to the high price of oil.

The tar at Shanghai is worked up mainly into suitable material for road surfacing, the tar-oils being marketed as naphtha, disinfectants, and wood preservatives.

Carbonizing results over a period of six months, together with an analysis of the coals analysed were given in Mr. Baker's paper. Description is given there also of results obtained when diluting the steamed coal gas with producer gas, in order to reach a final gas of 440 B.Th.U. per cubic foot. It was pointed out that Shanghai is in reality three cities in one, with three separate municipal administrations claiming jurisdiction over the business affairs and welfare generally of the residents. The International Settlement is controlled by the Shanghai Municipal Council, the French Concession by the French Municipal Council, and the Chinese Area beyond these two districts, by the City Government of Greater Shanghai. The Gas Company therefore negotiates with all three administrations.

An analysis of the gas sales shows that

65	per cent is used for cooking and water heating
32	,, ,, ,, ,, ,, industrial and heating purposes
1.8	,, ,, ,, ,, ,, public lighting
1.2	,, ,, ,, ,, ,, Gas works purposes

The nationality of the consumers is indicated by the following:

British	3,670	Japanese	2,297
French	640	Indian	176
German	224	Others, including American and Portuguese ..	2,633
Russian	987		
Chinese	2,814		

The Chinese, Japanese and Indian consumers demand special types of cooking appliances on which to prepare their respective native dishes. Gas at Shanghai is sold at 3s. 6.75d. per 1,000 cubic feet for cooking, and at 2s. 9.75 per 1,000 cubic feet for water-heating.

Oil holds the field for central heating in large buildings, Chinese coal being a formidable competitor. Unfortunately such coal is unsuitable for gas-making owing to its high ash-content and poor coking qualities.

In consequence of the continued movement of the majority of Shanghai residents, who live in the city for a period of three to five years, and then return to Europe or to America on long leave,

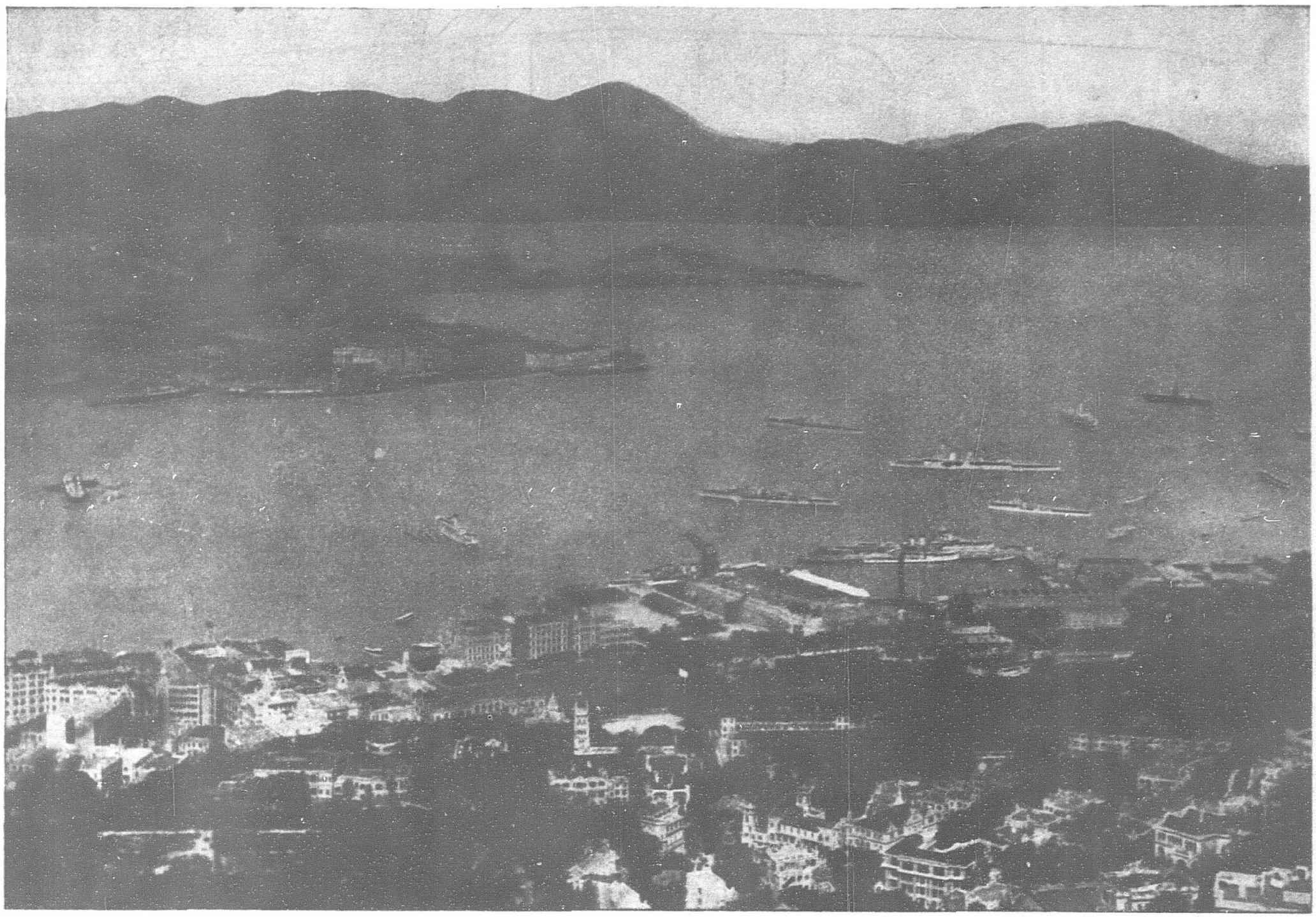


Fig. 2.—Looking down on the City of Victoria, Capital of Hongkong

it is impossible to sell domestic gas appliances outright, or on the hire-purchase system. All appliances are therefore installed on a simple hire—the hire charge being just sufficient to cover the capital charges on the apparatus.

The Shanghai Gas Company was formed in the year 1862: the works were built on a site at the junction of Soochow Creek and Thibet Road, and on November 1, 1865, gas was available for lighting purposes.

A rapid increase in the consumption of gas during the period 1900 to 1908 was probably due to the influx into Shanghai of Chinese and foreigners during the Boxer rebellion; to the improvement of the gas cooker; to improved incandescent lighting; and owing to an increase in factory buildings accompanied by an increase in the gas-engine power load. The lack of continued increase in consumption between 1908 and 1926 was undoubtedly due to electricity displacing gas for power and lighting, but a decrease in the output of gas was prevented by a steady increase in domestic and industrial heating appliances. The increase in consumption after the year 1926 was due to the rapid growth of Shanghai, and to the improvements in consumers' appliances. A drop in 1932 was directly due to Sino-Japanese hostilities.

During the year 1930 it was realized that the plant existing at that time was very inefficient, and was approaching the end of a useful life. In the new works the section having the manufacturing and purification plant is situated at the Thibet Road Works. The gasholders, offices, etc., are on the east side of the road. Various schemes were considered for erecting the new plant on the Thibet Road site, but the awkward position of the available vacant land presented many structural difficulties. It was eventually decided to build a new works on a new site.

The final scheme adopted allowed for a new manufacturing and purification plant on a new site, and a high-pressure pipe line connecting the new plant to the gasholders on the east side of Thibet Road. The scheme was to be financed by the sale of the site on the west of Thibet Road, the area of which was approximately five acres, with a sale value of £58,000 at the time. During the year 1931 a Whangpoo River site of 5½ acres in area was purchased at a cost of approximately £12,900 per acre. This site is 160-ft. wide and 1,425-ft. long, and lent itself to a much more satisfactory layout of plant than did a square site of larger area.

As to the rate of pay for Chinese labor, this has increased enormously during recent years, as will be appreciated from the following table:—

	Wages for Working Day	
Year	*Stokers*	*Coolies*
1900	8.25d.	5.25
1925	11.25d.	7.20
1935	1s. 6.15d.	1s. 0.15

A further point in favor of mechanically-operated plant was the uncertainty of Chinese labor. In the event of a strike it was considered that the foreign staff of 50 men could operate such a plant over a long period. Therefore, taking these points into consideration, i.e., the high cost of land, and the increased cost and uncertainty of native labor, it was finally resolved to install mechanical coal-handling plant in a closed store, vertical retort plant, and mechanical coke-handling plant and screening plant.

Hongkong.—As to Hongkong, Whittaker's Almanack for the present year (1939) informs us that it consists of a number of islands, and of a portion of the mainland, situated off the southeastern coast of China at the mouth of the Canton River, and bounded on the north by the Shum Chum River.

Hongkong, an island 11 miles long, and from two to five miles broad, with a total area of 32 sq. miles, lies close to the mainland, being separated at one point by a narrow strait (Lyeemoon) not more than a quarter of a mile wide. The island was first occupied by Great Britain in January, 1841, and was formally ceded by the Treaty of Nankin in 1842. British Kowloon was subsequently acquired by the Peking Convention of 1860: and the New Territories (being a peninsula in the southern part of the Kwantung province) by a lease of about 391 sq. miles with a population of 1,028,619 in the year 1898. The non-Chinese residents, excluding naval and military, numbered 23,096.

Shipping entering Hongkong in 1936 was 20,849,057 tons. In 1937 it was 18,787,712 tons. A railway, of which 22¼ miles belong to the British Government, runs from Kowloon to Hankow. The highest peak of the mountains is Victoria Peak, about 1,809 feet high. The Peak District is a favorite place of residence, and is reserved for Europeans. The hot season lasts from May to October. During the winter months, from November to March, the climate is cooler, drier and more invigorating. The average daily maximum temperature ranges from 87°F. in July to 63° in February. The average daily minimum temperature runs from 78°F. in July to 55° in February. The average annual rainfall is 85 inches, of which no less than 75 per cent falls between the months of May and September, when the south-west monsoon prevails.

Much encouragement is given by the Government to education in Hongkong. In 1937 there were 1,177 schools subject to Govern-

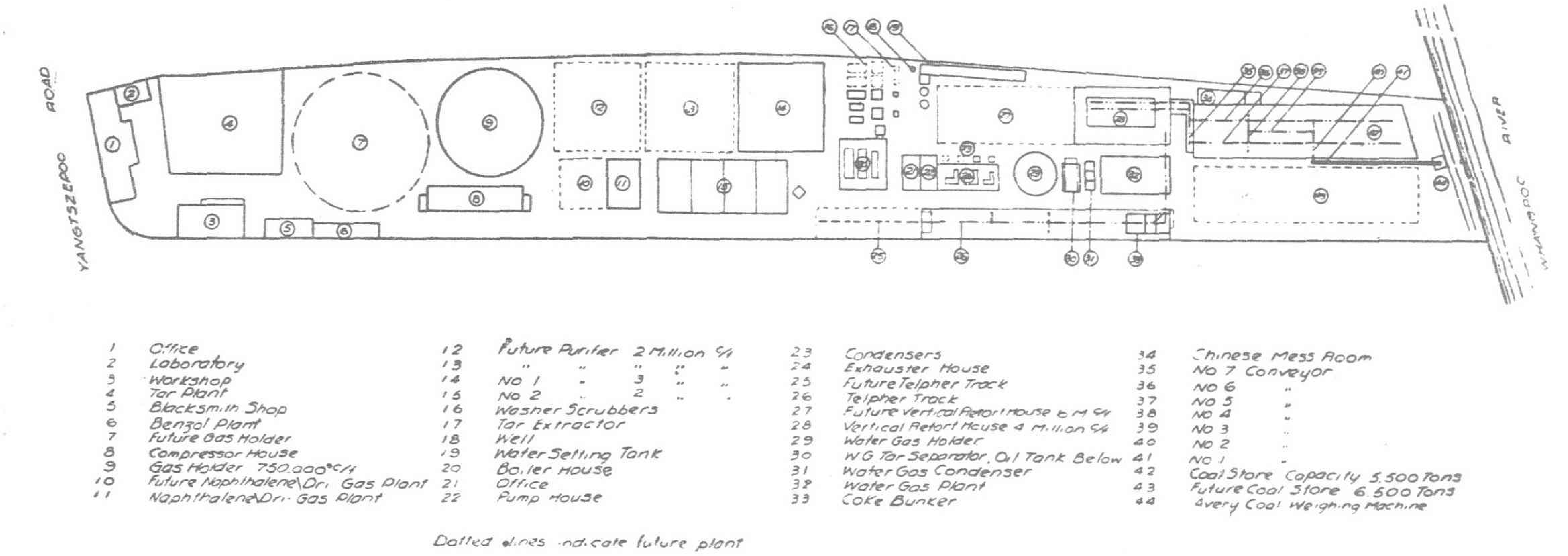


Fig. 4.—Plan of the Yangtszepoo Gas Works at Shanghai; capacity four mill. cu. ft. per day, with provision for extensions to produce eight mill. cu. ft.

ment supervision, attended by 86,993 scholars. The University of Hongkong, opened in 1912, includes faculties of medicine, engineering and arts.

The Government of Hongkong is administered by an Executive Council of nine members, together with a Legislative Council of eighteen members, including the Governor, a representative from the Chamber of Commerce, and a representative of the Justice of the Peace. There is also an Urban Council in which are vested *inter alia* powers of making by-laws in respect to health and sanitation.

Gas manufacture and supply in Manchuria is in the hands of the South Manchuria Railway Company, working with Japanese capital and under Japanese control. This Company founded the gas undertaking in Dairen in 1910, carbonizing coal from Fushun, and very soon after in Mukden, Fushun, Changchun (renamed Hsinking since it was selected as the capital of Manchoukuo), and other towns. In 1925 these undertakings were taken over by a subsidiary company, the south Manchuria Gas Company, with a capital of ten million yen. The Company's head office is in Dairen, and it has branch offices at Anchan, Mukden, Antung and Hsinking. Its production in 1929 was 15¼ million cubic meters (539 million cubic feet) supplied to 74,753 households and factories. In Korea, the capital, Seoul, is equipped with a gas works where it is believed inclined retorts with modern coal and coke-handling plants are in operation.

The Hongkong and China Gas Company was incorporated in England in the year 1862 to supply gas to the City of Victoria, Hongkong, China, and to other places in China. Hongkong was first lighted on November 3, 1864, by gas, which in the early days of the Company, was supplied almost solely for that purpose; later, the uses of gas were extended for cooking, heating, and other domestic and industrial purposes.

In addition to the works in Hongkong, the Company erected plant in Kowloon, and gas was first supplied in that district on November 1, 1892. Both these works have been extended from time to time and have been brought up to date. The latest type of Glover-West vertical retorts and Humphrey and Glasgow water gas plant are in operation at the Hongkong Works, and the gas is analysed and tested daily to ensure its purity and thermal content. The present annual make is 274 million cubic feet (*vide* The Register of the Gas Industry 1939 published by Hallows and Slaughter, 121 Victoria Street, London, S.W.1) the number of consumers is 4,277; there are 2,617 public lamps lighted by gas; the price of gas is 4½ dollars per 1,000 cubic feet; the calorific value is 400. It may be added that the General Manager and Engineer is Mr. H. Stone, Member of the Institution of Gas Engineers.

The Hongkong Gas Company has, in addition to the large showrooms at West Point Works, where a large range of gas apparatus is exhibited, two further showrooms, one on Gloucester Buildings, Hongkong (one of the largest and most up-to-date buildings in the Colony), and the other in Nathan Road, Kowloon, where customers can view and order apparatus. These showrooms have proved to be most beneficial to Company and to customer alike.

Coal of a suitable nature for gas-making is, so far, not obtainable locally, and it has been found, from years of experience, that, situated as the Company is in China, it is economical to carbonize mostly Japanese coal. Some Australian coal is carbonized, and is found an excellent coal for gas-making.

The Company has experienced difficulties in finding markets for its residuals, but, by constant attention to this important matter, a considerable quantity of coke and tar have been disposed of on advantageous terms. A large number of new flats are being erected on the mainland of Kowloon. All these are being piped for gas, and it is the general opinion that a steady increase in consumption can be expected.

When reviewing the progress of the gas industry in a Colony such as Hongkong, it is a matter for congratulation that in spite of the high temperature (frost being unknown in Hongkong) which prevails during a considerable period of the year, the Company is able to hold its own against competition, and to record steady progress.

It is interesting to observe that the consumption of gas has increased from 63¼ million cubic feet at Hongkong and 5¾ million cubic feet at Kowloon for the year 1900, to an annual total make of 274,000,000 cubic feet.

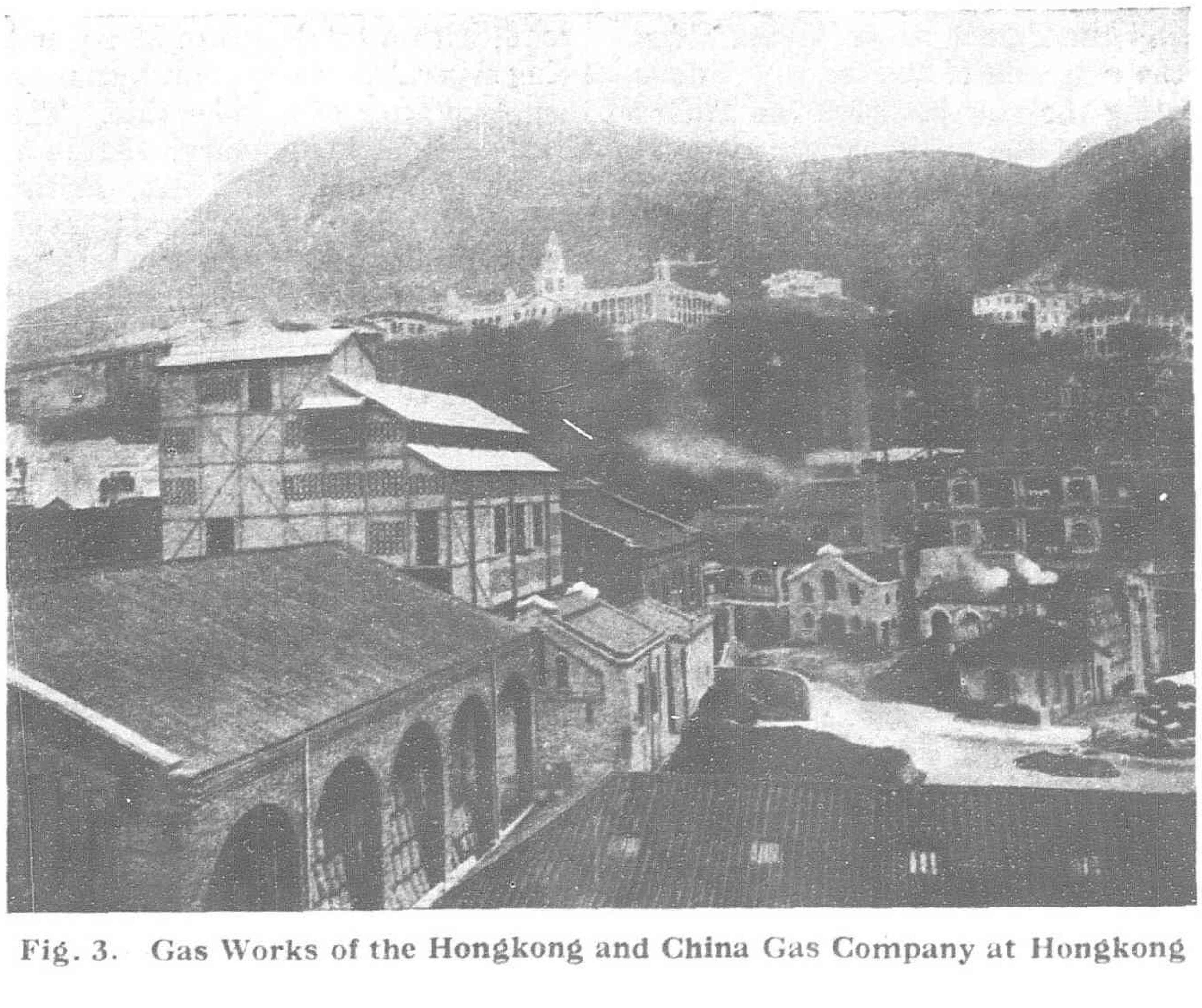
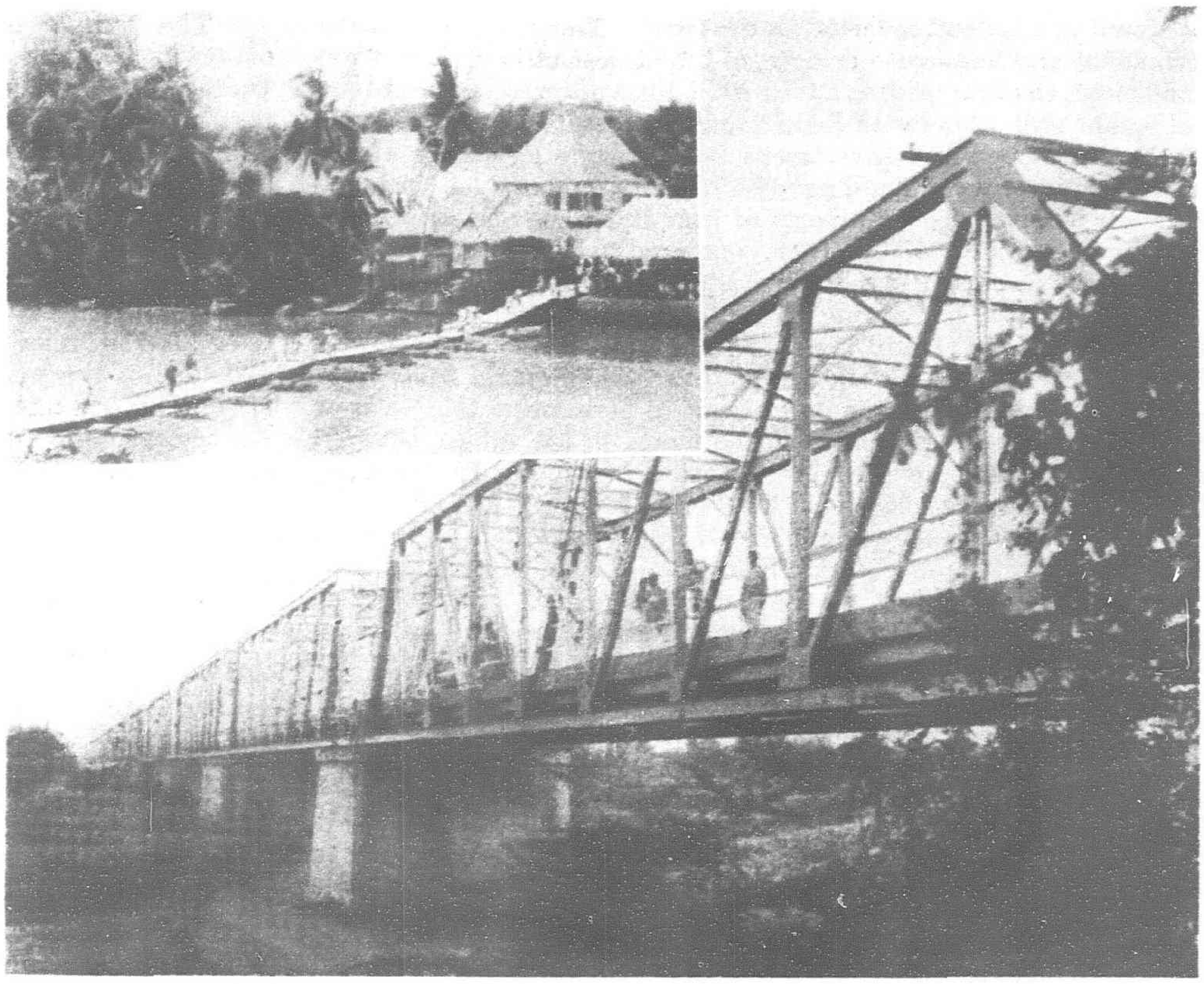


Fig. 3. Gas Works of the Hongkong and China Gas Company at Hongkong

American Motors on Highways of the Philippines

(American Chamber of Commerce Journal)

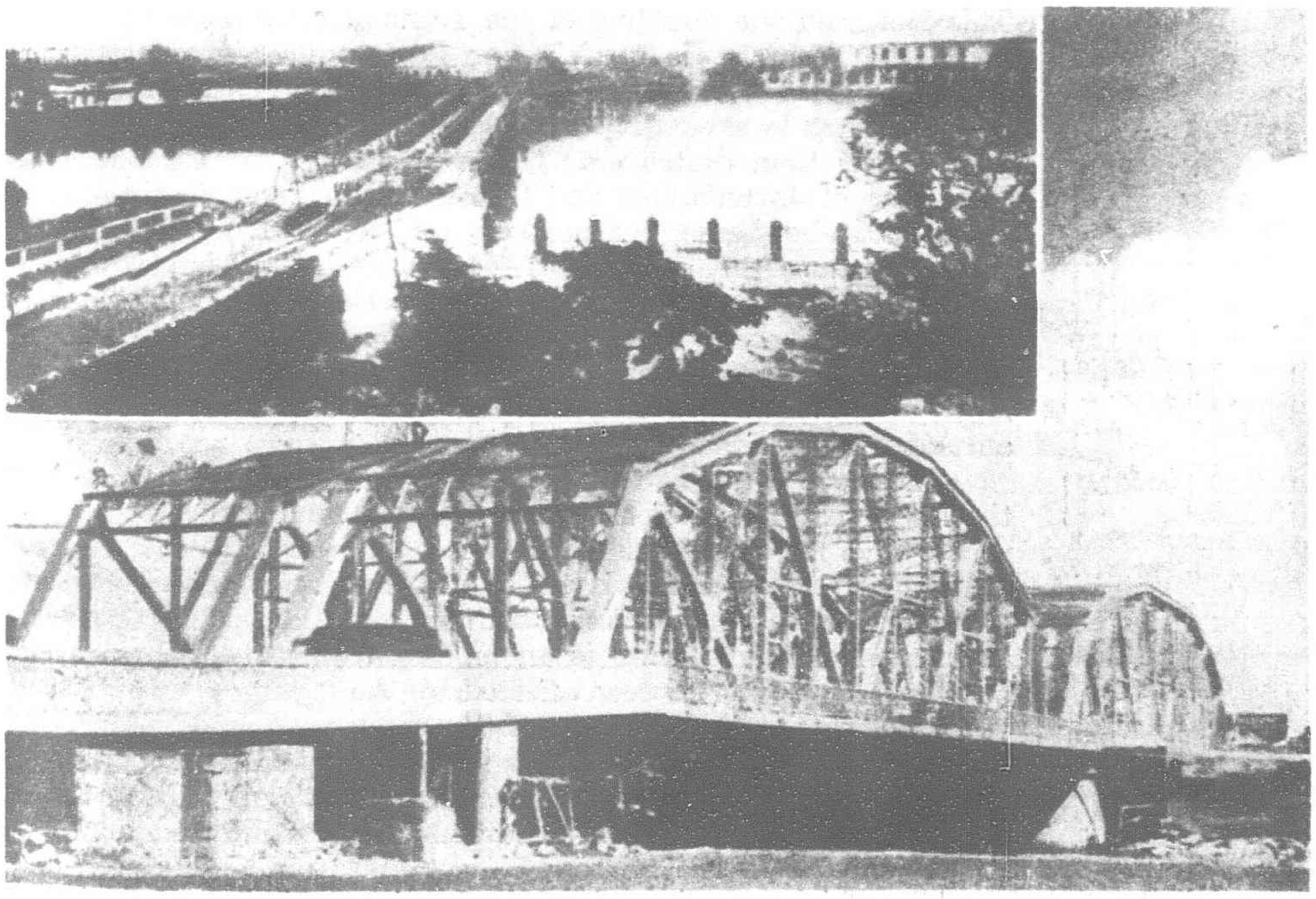
AMERICAN automobiles have been sold in a steadily expanding market in the Philippines from the time when mass production and the assembly line made them low priced. This is because the Philippines began building a system of interprovincial public highways as soon as civil government was established (July 4, 1902) and have ever since devoted a liberal portion of their yearly general revenue to this important branch of communication. Thirty years ago, W. Cameron Forbes, then governor general, got a personal registration tax of a dollar a year approved, half of it for roads and the other half for local schools. Doing this, he built a section of what was then a modern highway and proved its public worth to insular and provincial lawmakers.



General Luna Bridge over the Rio Grande de la Pampanga at Cabanatuan, capital of Nueva Ecija, one of the 49 Philippine provinces, is one of the longest bridges in the Islands. The insert shows a pontoon bridge similar to the old one that in the dry season formerly served Cabanatuan at great cost of time and money

That was but the beginning, and roads were never before as well fostered in the Philippines as they now are under the commonwealth and President Quezon. It is vital in Quezon's basic policy to procure Mindanao's rapid development by means of immigration from other regions of the Islands, and this entails road building on a big scale. A sum of P.20,000,000 is current for such work, while much has already been spent and plans already effected assure large appropriations in the future. It has been discovered that where roads are built, settlers follows; indeed, the settlers are often the very workmen who build the roads and bridges. Automobiles come at once, most of them in the business of public transportation.

The business of public transportation over trunkroads in the Philippine provinces has long been very important and remunerative to the capital invested, much of it American capital accumulated from constant expansion of the lines and living up to the license requirements of the utility commission. Though fuel, oil (both highly taxed) and equipment and repairs are costly, the passenger fare of one centavo per kilometer is one of the lowest rates in the world. Here impinges on the problem of successful operation, the constantly growing population and the progress of industry in the towns as well as on the farm. Modernization of the sugar industry is in point, in the Bisayas and throughout central Luzon, and modernization of the Manila hemp industry in Davao and Cotabato, with many factories, affecting the coconut industry, either expressing oil or desiccating the coconut meat.



A bridge in the Capiz and the Ayala two-lane bridge over the Pasig in Manila. As the Philippines build more motor roads, they bridge the waterways permanently, adding millions of pesos to their yearly bill for American iron and steel, besides construction machinery and equipment

Schools are possibly a more basic factor still, getting 1,600,000 children to and from school during 40 weeks of the year signifies much motor transportation. But accumulation of private fortunes of small calibre, yet substantial, in industry and mining also provides a considerable market for cars above the popular-priced ones, and these too are of American manufacture. While the American car sells everywhere, to some extent, the small Philippine duty on foreign cars is an advantage in this market; not of course comparable in any way to the government's good-roads policy, yet basically effective. The military program signifies the sale of many cars and trucks, and no one is more circumspect in enforcing the flag law than President Quezon, who, when the government buys, has a direct say about it.

Motor vehicles invoiced to this market last year summed a value of P.9,719,491 or 3.7 per cent of total imports by value. Accessories added another P.2,989,017. Tires added P.3,529,661. The sum of these three items is P.16,238,169, up P.3,260,139 from 1937. If American cars and tires had no worse markets than they have here, the industry would be running extra time.

All the roads involve many bridges, culverts, spillways and causeways. A revolving fund of P.5,000,000 for bridges was set up 20 years ago, the cost of each bridge to be recovered in tolls and reverted to the fund. This resulted in many permanent and handsome bridges, of the utmost utility. But it was insufficient, so other bridges have been built with proceeds of provincial bonds, still others with loans from the Postal Savings Bank and the National Loan and Investment Board, while legislative appropriations and provincial aid have built many more. Such vast construction involves heavy imports of iron and steel, and helped run them up to P.26,011,555 last year, compared to P.23,229,735 in 1937.

Motor vehicles licensed for use in the Philippines last year numbered 51,751, comparing to 32,280 in 1929, the difference in number being 19,471 and *the expansion of the market in a decade, 61 per cent.* In this period, first class roads extended from 6,615 to 9,978 kilometers and the investment in permanent bridges grew enormously. Comparisons should be made, in the tables, between highways and registered vehicles in each province. In the same decade, license collections rose from P.1,341,364 to P.4,637,469 under a general law excellently administered by the Automotive Division of the Bureau of Public Works, Salustiano Reyes, superintendent.

Material curtailment of the American market for Philippine products would smash this automotive trade to pieces, and American farmers who blindly inveigh for that curtailment would soon feel the dire effects of it: they are interested almost equally with the manufacturers in keeping such an established outlet for American cars and trucks and tires and accessories open without duties or quotas. Yet if the Philippines may not sell, they cannot buy. Senator Millard E. Tydings has said (in committee hearings) that this is not the time for the Philippines to talk about such facts. We plead that it is. It is the Islands' business to present their economic case, and they surely have one for America's careful perusal:

ROADS IN THE PHILIPPINES BY KILOMETERS

Provinces	*First Class*		*Second Class*		*Third Class*	
	1938	*1929*	*1938*	*1929*	*1938*	*1929*
Abra	106.7	75.2	73.4	15.5	23.5	21.9
Agusan	68.0	—	64.1	41.7	14.1	17.6
Albay	258.8	231.6	87.7	47.0	34.9	28.1
Catanduanes	89.8	—	1.6	—	21.9	—
Antique	196.1	98.7	79.9	115.9	4.4	18.4
Bataan	74.1	46.7	36.0	18.2	73.6	2.4
Batanes	18.7	—	8.2	—	4.0	30.0
Batangas	279.9	208.5	130.9	73.0	78.4	143.0
Benguet	80.1	74.0	207.3	166.5	7.5	14.4
Bohol	371.5	263.4	176.9	100.2	29.0	72.2
Bukidnon	173.3	—	22.0	110.6	42.6	80.4
Bulacan	200.5	158.3	170.0	111.3	108.7	63.8
Cagayan	282.7	95.7	91.1	106.9	76.4	74.4
Cam. Norte	90.5	40.9	67.1	22.0	25.2	33.5
Cam. Sur	209.5	175.1	120.8	65.6	53.0	45.0
Capiz	286.6	202.3	116.9	112.7	54.6	50.3
Cavite..	110.6	101.3	134.8	52.2	67.5	4.2
Cebu	707.6	337.3	254.2	310.3	15.0	92.3
Cotabato	86.2	35.9	143.4	22.2	76.1	17.4
Davao..	30.8	37.4	102.8	14.8	75.1	46.2
Ilocos Norte	188.4	91.4	162.6	151.7	54.6	27.1
Ilocos Sur	224.3	196.3	70.5	67.8	14.2	12.2
Iloilo	438.7	323.0	139.9	78.5	209.8	130.4
Isabela..	260.2	135.9	1.2	19.4	66.8	25.2
Laguna	243.1	178.6	56.6	52.7	11.7	29.9
Lanao	57.8	50.7	184.2	24.0	103.9	30.6
La Union	154.4	141.9	99.8	52.8	4.8	8.3
Leyte	199.4	141.8	367.5	146.8	83.4	47.3
Marinduque	54.4	52.6	92.1	39.6	—	13.1
Masbate	92.2	71.02	89.4	3.5	27.6	1.2
Mindoro	125.1	54.8	88.1	70.0	27.1	15.0
Misamis Occ.	158.9	128.4 }	26.6	139.3 }	7.7	81.9 }
Misamis Or.	177.3	— }	170.6	— }	43.3	— }
Mt. Province	31.1	—	375.0	295.1	148.8	43.7
Negros Occ.	552.9	426.3	155.5	90.2	56.2	43.4
Negros Or.	200.8	197.4 }	126.8	82.2 }	29.8	37.0 }
Siquijor	84.7	— }	37.4	— }	2.6	— }
Nueva Ecija	328.2	207.5	286.6	37.5	66.5	225.8
Nueva Vizcaya ..	112.8	94.1	21.5	18.2	33.5	31.7
Palawan	2.8	—	63.6	19.4	124.1	54.8
Pampanga	229.5	204.7	70.4	84.5	165.8	79.2
Pangasinan	619.1	542.8	91.8	48.2	119.4	125.9
Rizal	265.8	194.8	30.9	21.5	10.2	46.4
Romblon	52.3	—	135.7	99.4	—	1.0
Samar	308.9	137.0	195.0	180.4	89.3	73.9
Sorsogon	175.7	165.3	97.6	42.1	27.8	9.5
Sulu	159.2	59.7	47.1	6.3	29.4	8.7
Surigao	117.3	73.3	68.3	22.7	132.6	25.2
Tarlac	247.5	178.0	26.8	24.3	31.8	14.4
Tayabas	265.5	219.5	224.1	58.4	78.1	51.2
Zambales	163.6	130.4	5.7	23.0	9.5	—
Zamboanga	—	62.1	139.7	108.2	38.2	24.0
Total	9,977.9	6,614.62	5,837.7	3,614.3	2,733.9	2,173.5

The *Tire Review*, April, 1938, reports that the United States exported 1,053,161 tires last year, running a close second to the United Kingdom whose exports totalled 1,225,512. Canada exported 719,222 tires. As the bulk of Canadian tire manufacturing activity is controlled by American capital, American manufacturers having established Canadian tire plants many years ago to enjoy the advantage of Canada's reciprocal trade agreements, the United States therefor virtually leads in exports. France exported 504,399 tires and Germany 216,756 last year.

Uncle Sam's biggest customer was the Philippine Islands, which took 128,719 American casings. American export by geographical divisions of the world were: Central America, 22,009 tires; West Indies, 168,981; South America, 185,526; Europe, 254,128; North Europe, 98,666; Central Europe, 109,401; South Europe, 40,797; Near East, 37,167; Africa, 26,578; Asia, 191,985; Oceania, 5,832. U.S. North American exports (Alaska, Hawaii, Mexico, etc.), were 161,055.

The United States' smallest customers were Iceland, taking four tires, and Ireland, taking 12.

The Russian Navy

"What sort of a Navy have the Russians got?" is a question that few people in this country have ever bothered to ask, and one which few but intelligence agents can answer satisfactorily, says W. V. Emanuel in *The Listener*. Yet the Russian Navy is taken extremely seriously by the Germans and Japanese, and by the Italians, who for all the so-called clash of ideologies, still build ships for it.

We Englishmen seldom have a chance of seeing Russian warships, but two years ago the *Marat* came to the Coronation Review at Spithead. She and her men, dashing about in fast launches, looked to me and to others more competent to judge, remarkably efficient. The *Marat* and the only other Russian battleship in active commission belong to the Baltic Fleet; the third completed battleship is in the Black Sea.

Besides the Baltic and Black Sea Fleets, the Russians have fleets in the White Sea and in the Far East, and smaller flotillas on the Amur river, and on the Caspian, where at Baku I remember being impressed with the size of the vessels in that land-locked sea. But a net work of canals makes it possible for destroyers and submarines, at least, to pass between the various fleets without having to go all round Europe or Asia.

Reinforcements for Vladivostock, moreover, can and do steam across the Arctic Ocean, out of range of enemy aircraft or submarines. This fact, and the doubling of the Trans-Siberian Railway track, make the position of Russia's Far Eastern fleet much stronger than it was in the Russo-Japanese war. At Vladivostock now is a fleet of at least seventy submarines, and numerous small craft, none larger than destroyers; these are enough to immobilize a large part of Japan's fleet and threaten her communications with China and elsewhere.

Almost as many submarines—for Russia has the largest underwater fleet in the world—could threaten Germany's command of the Baltic. There, a considerable surface fleet, consisting of the two 12-in. gun battleships, five or six fast modern cruisers, twelve large flotilla-leaders, and at least fitfeen destroyers, could support an underwater offensive.

The Soviet Press has in the last two years been busy preaching the doctrines of the offensive and a big oceanic navy, principles which have recently found expression in the laying down of new battleships and several cruisers. How far this new offensive spirit would find expression in action is the great question. The personnel, as in most foreign navies, is an unknown quantity. How much has the Navy's morale been affected by the "purges" which two years ago removed every one of the fleet commanders? From recent articles in the Soviet Press it seems that the Navy is being given strong doses of party enthusiasm. Last year, fifteen times as many students at the raval academies were admitted to party membership as in 1937.

The Chief Commissar for Naval Affairs, Admiral Kusnetzoff, is no politician, but a real sailor. At thirty-seven, he is the youngest Commander-in-Chief of any navy, and a striking contrast to the bearded veterans of the Tsarist Navy.

Oil Resources of the U.S.S.R.

By the Late Professor I. M. GUBKIN, in The Mining Journal

THE period of the Second Five-Year Plan saw a tremendous development of geological oil research in the Soviet Union, the result of which may be seen in the figures relating to the oil reserves of the country. At the beginning of that period (1933) the oil reserves of the U.S.S.R. were estimated at 1,561 million tons. Allocating these reserves into three categories, according to the extent to which they had been investigated and studied, there were 206 million tons of industrial reserves, 274 million tons of putative reserves, and 1,081 million tons of geological, or prospective reserves.

By the beginning of the Third Five-Year Plan (1938) the Soviet reserves of oil were estimated at 8,662 million tons, of which 987 million tons were industrial reserves, 3,665 million tons were putative reserves, and 4,010 million tons were geological or prospective reserves. These calculations are based not on gross quantities, but with allowance for inevitable losses under existing methods of exploitation whereby it is impossible to draw off all the oil from the oil-bearing layers; that is to say, the foregoing figures of oil reserves represent quantities which can actually be brought to the surface.

The first deduction to be drawn from the comparison of these figures is that there has been an increase in the total oil reserves of 7,101 million tons, or of 477 per cent. Industrial reserves have increased by 781 million tons (380 per cent), putative reserves by 3,391 million tons (1,237 per cent) and geological or prospective reserves by 2,929 million tons (270 per cent).

I need not here go into the importance of this increase in reserves, but will simply point out that the increase of reserves in the first two categories alone exceed the oil reserves of the entire Asiatic continent, including Irak and Iran.

The following table shows the specific proportion of the various categories of oil reserves to the total reserves, as established on January 1, 1933 and January 1, 1938.

	1932 *Percentage*	*1937* *Percentage*
Industrial reserves	13.8	11.4
Putative reserves	18.2	42.3
Geological or prospective reserves ..	68.0	46.3
	100.0	100.0

From the foregoing figures it is obvious that though the absolute increase in industrial oil reserves over the five years has been almost fivefold, their proportion to the total reserves has not increased but has actually dropped, namely, from 13.8 per cent to 11.4 per cent. At the same time there has been a sharp increase in the proportion coming under the category of putative reserves, which has risen from 18.2 per cent to 42.3 per cent.

This disparity in the rates of increase of the different categories forming the aggregate reserves has been due to a considerable lag in boring operations both for prospecting and exploitation purposes.

Therefore the primary task of the Soviet oil industry under the Third Five-Year Plan is to intensify prospecting with a view to ascertaining the industrial importance of oil deposits, and to ensure that the new oil fields ready for exploitation exceed the industrial demand for them.

To-day very many areas have been prepared for detailed investigation, including some which are highly suitable for industrial exploitation. Owing to the complexity of the oil industry the opening up of new areas has to proceed gradually and in close relation and proximity to areas already under exploitation. This principle ensures the swiftest possible development of the new areas on the basis of the already established economic and technical organization in the old areas. Electricity supply, water, housing—these and other important problems of the oil industry are more easy of solution in areas already under industrial exploitation or in areas immediately adjacent to them.

Under the Third Five-Year Plan, the opening up of new areas will follow a strict plan for the systematic development of those oil fields most advantageous from a technical and economic standpoint.

I cannot within the limits of this short article consider the question in detail, but I shall try to show how far the results of the geological research in oil carried out during the Second Five-Year Plan makes it possible to attain the objective laid down in the theses of Mr. Molotov's report to the Eighteenth Congress of the Communist Party of the Soviet Union, namely, to change the geographical distribution of the Soviet oil industry.

For more than a hundred and fifty years the Ural-Volga region has attracted the attention of geologists who have attempted to determine whether the area is oil-bearing. But only during the Second Five-Year Plan were results achieved which completely justified our former hopes.

The honor of making the first serious scientific prognosis as to the oil-bearing character of the Ural-Volga region belongs to the late Academician A. P. Pavlov.

Five years ago, in his report to the Seventeenth Congress of the Communist Party of the Soviet Union, Stalin raised the question of creating a new oil base "within the limits of the western and southern slopes of the Ural range."

At present this region presents itself to us as a platform broken up by a series of tectonic disturbances with which are connected dozens of ascertained oil formations and doubtless hundreds of others still undiscovered.

On the territory of this region is another type of formation, in all probability widely distributed over the system of folds in the zone adjacent to the Urals, a formation connected with the outcrops of ancient buried reliefs, representing isolated elevations. In the conditions of the platform the formations have a very declivous character, many of them being imperceptible to the eye, and for their ascertainment an instrumental geodesic survey is required. In this regard the Volga-Ural region is very similar to the oil-bearing region of the mid-continent of the U.S.A.

The oil-bearing pockets of the region relate chiefly to the carboniferous system, the horizon "B" being the more productive.

The less productive horizon "A" occurs in the lowest strata of the middle carboniferous system. Without stopping to discuss the oil-bearing nature of the Permian deposits situated on the territory of the region, I must point to the almost universal distribution of oil-bearing horizons of the middle and lower carboniferous system throughout the region.

So far boring operations have not penetrated to the Devonian system, which is of interest because of its oil-bearing possibilities, remembering that at Ukhta this system is oil-bearing.

At the present time oilfields in the Ural-Volga region are already being worked by the Kama, Syzran and Tuimazy Oil Trusts. The "Second Baku" has become a practical reality. This was the achievement of the Second Five-Year Plan.

The tasks of the Third Five-Year Plan in regard to the Ural-Volga region comprise the search for new oil-bearing formations and the study of the reliefs of the crystalline base, simultaneously with study of the oil-bearing possibilities of the Devonian system. Exploitation of those oil-bearing formations already discovered is alone sufficient to provide the oil output called for in Mr. Molotov's theses on the Third Five-Year Plan.

While confining myself to this short survey of the "Second Baku" region, I must point out that the achievements of Soviet geology in the extension of our knowledge relating to the distribution of the oil-bearing zones throughout the territory of the U.S.S.R. are not confined to this one region. The Second Five-Year Plan also provided new data which strengthen our hypotheses concerning the oil-bearing possibilities of Siberia.

The new facts confirm us in the supposition that the coal layer on the eastern slopes of the Ural range, shown by the coal outcrops, farther east, in the direction of Western Siberia, passes into an oil-bearing layer. Signs of oil-bearing zones have been discovered along one of the tributaries of the River Tavda, in the Zverino-Golovsky district on the borders of Chelyabinsk province and Kazakhstan, along the Siberian main railway near Gankino, and also in the district of Bolshoi Yugan and to the south of it on the

(Continued on page 461)

The New Kawabe Dam

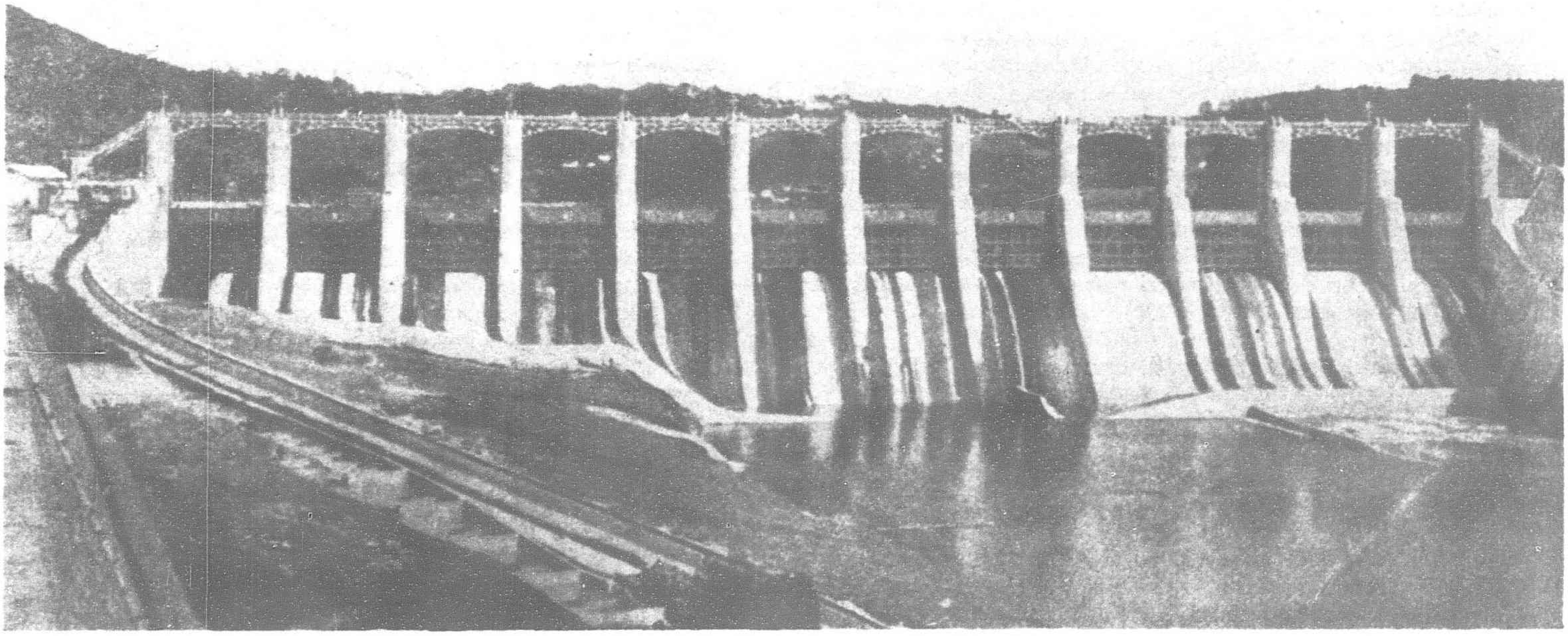
Important Project for Toho Electric Power Company is Completed by The Ishikawajima Shipbuilding Company

The Ishikawajima Shipbuilding Company recently fabricated a diversion dam of huge dimensions for the Kawabe power plant of the Toho Electric Power Company, traversing the lower stream of the Hida River, a tributary of the Kiso River in Gifu prefecture.

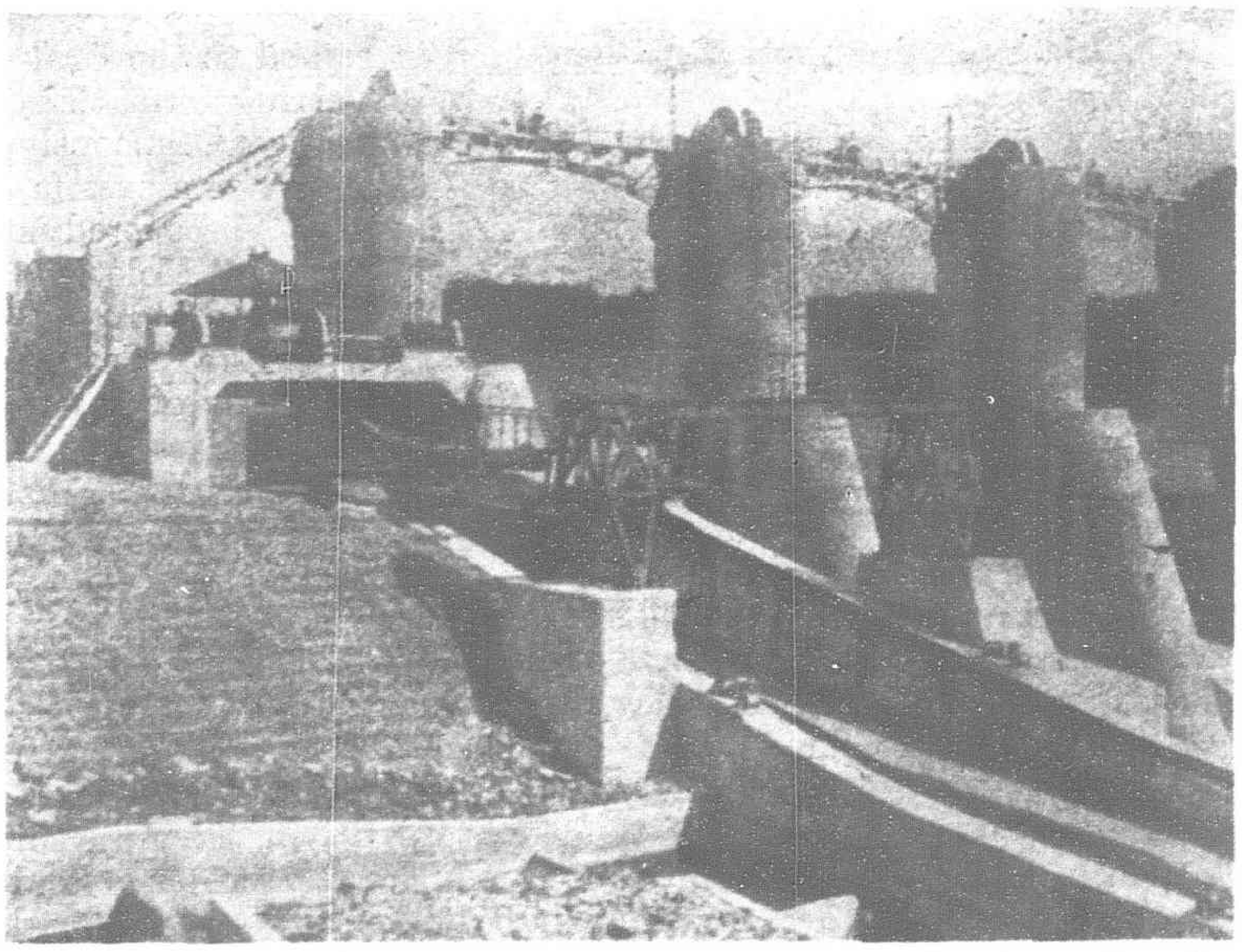
Having an effective head of 24.33 meters, developing a maximum electric power of 26,500 kw., the dam has a total spread at its crest of 178 meters and a height of 35 meters from bed rock to the top of the gate. There are altogether 12 sluice gates with appurtenant bridges and other features, beside being equipped with three sluice gates for water tank, a boat-raftway, a stand-by Diesel engine with generator, a head race, a scouring sluice, etc., all having been constructed by the Ishiwakajima Shipbuilding Company.

The sluice gates of the dam consist of 12 roller gates each having a clear span of 11.8 meters and a height of eight meters. One gate is made to sustain a water pressure of 410 tons, and is supported by means of eight rollers, two of which are recessed in one rocker beam, making each roller sustain an equal pressure of water.

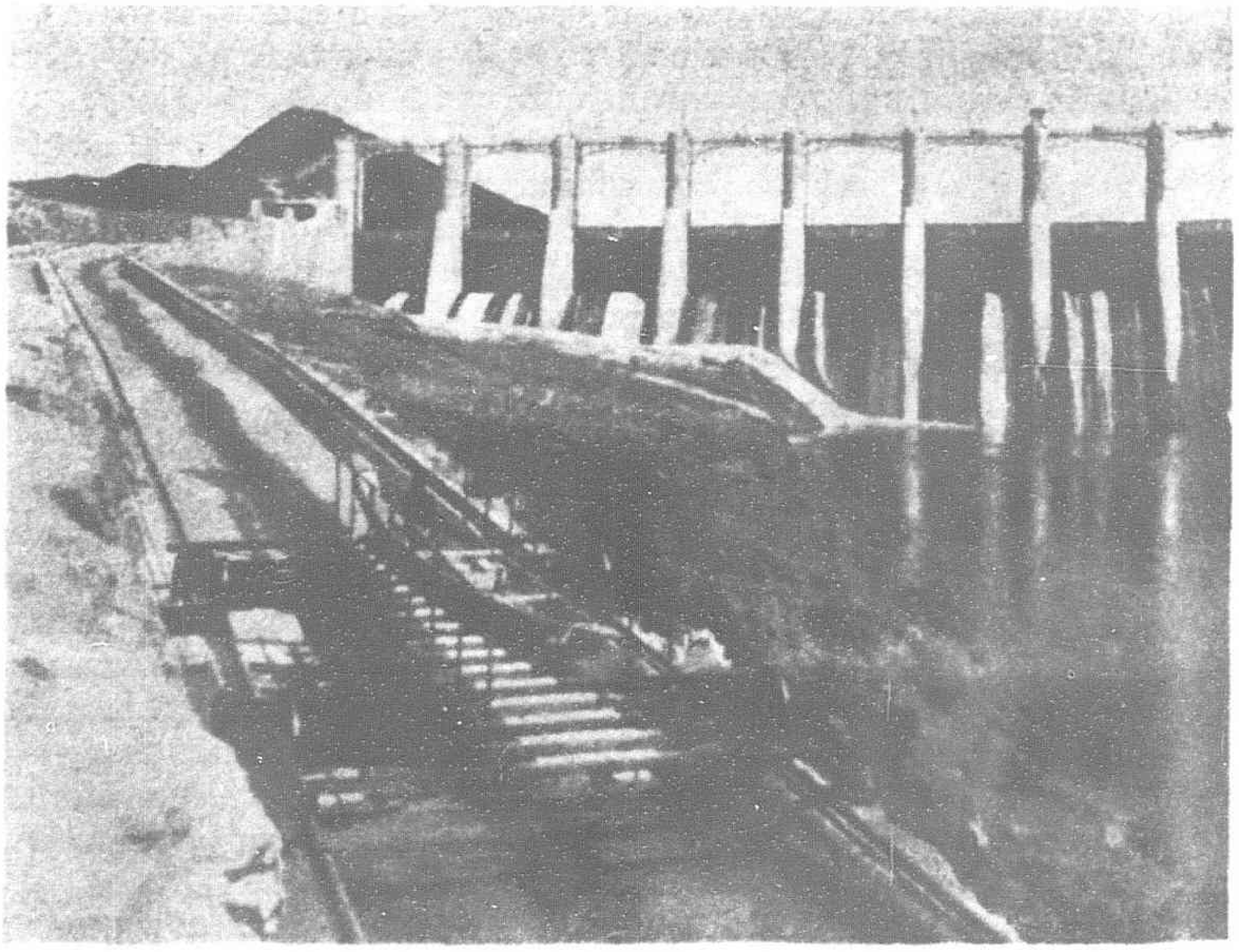
Special attention has been paid in the construction of these gates so as to make them immune to any deflection of the materials



General view of the huge dam on the Kiso River



Another view of the dam showing entrance to the channel and submerging gate with boat carrier and winch



In foreground is the boat carrier on rails along the channel and head-race to the water tank at extreme right used affected by changes in climate, temperature as well as water pressure, and hard rubber bands are used around the gates for sealing against leakage of water from any corner.

A hoist mounted with a 25 h.p. motor capable of lifting the gates of the dam at a speed of 0.35 meters per minute, is installed midlength of the bridge above, and lifting or lowering of the gates is done by steel wire ropes.

Three roller gates, each having a clear span of nine meters and a height of eight meters, constitute the sluice gates for the water tank, which is set up to the right of the dam, penstocks from which guide the impounded water to three water turbines of the Kawabe power plant for the ultimate generation of a maximum of 26,500 kw. The hoist for these three gates is equipped on the slab on top of the pier.

One gate is made to sustain a water pressure of approximately 290 tons, and is supported by four rollers. While the number of rollers is reduced by one half as compared with those employed for the dam, the gates here are made larger in diameter than the former.

A hoist mounted with a 35 h.p. motor has been installed, capable of lifting the gates at a speed of 1.8 meters per minute. While the starting of lifting or lowering by the hoist is effected by means of a push-button switch, stopping or starting in the course of lifting is done by a float switch which automatically operates as the level of water mounts or recedes. This device was specially provided for the purpose of preventing a sudden flow of water which may cause an untoward effect to the power plant.

A boat-raftway starts from a point to the right of the dam close to the pier, extending for a distance of 265 meters, its channel having a width of five meters and depth of 1.15 meters, with an inclination of ¼ at its upper part and 1/9 at its lower part.

At the entrance of the channel is installed a submerging gate having a height of 2.35 meters for regulating the flow of water. At the front and rear of the gate are equipped special devices each having a length of six meters. These serve, to make the passing rafts flow smoothly down the channel as the gate submerges into the water. When a boat is to pass, the boat-carrier is lowered to a level where it is convenient to saddle the vessel which then runs along the rails of the channel at a speed of 40 meters, the carrier being operated from the winch equipped on the slab above the submerging gate.

All gates are operated by means of push-button switches either for direct control from the side of the motor on the bridge or for remote control from the watch tower. In either case, it is so arranged that gate opening indicators installed at respective places automatically tell the extent of opening.

In the watch tower are installed a high speed Diesel engine directly connected to a three phase A.C. generator and other electrical apparatuses which are available in case of emergency. The Diesel engine, equipped with eight cylinders, is capable of developing 250 h.p. at 1,200 r.p.m., and the three phase A.C. generator develops 150 kva at 1,200 r.p.m.—*Japan Times Weekly.*

Oil Resources of the U.S.S.R.

(Continued from page 459)

River Vasiugan, and in the district of Barzass, and elsewhere. In the Trans-Baikal region the lower Cambrian system has also shown possibilities of being oil-bearing.

All these and many other factors necessitate a very radical revision of our previous conceptions as to the oil-bearing character of Siberia. The same may be said in regard to Central Asia.

In addition, the discovery of signs of oil-bearing horizons close to the town of Romny and the village of Isachik in the Ukraine makes it possible to count on the production of oil in these areas.

Meantime, the old Baku region is steadily developing and adding to the Soviet reserves of oil by the extension of the oil-bearing zones and the discovery of new oil-bearing horizons. Only eighteen months ago the proposal to extend the Bibi-Eibat field was purely hypothetical; to-day the wells sunk on the heights of the lime ridges of Bibi-Eibat have yielded oil. The wells in the Yasamalsk valley beyond Volchy Voroti have also yielded oil, and to-day it is possible to speak of an almost unbroken oil-bearing zone, stretching from Bibi-Eibat to Sulu-Tepe.

The extension of the Kara-Chukhur field is to-day a solved problem. The Second Five-Year Plan has given us many presents not only on the Apsheron Peninsula, but in other districts of Azerbaijan. In the North Caucasus also much has been achieved, including the opening up of a new and rich prospective oil-bearing district in Daghestan.

Summarizing the results of the work carried out during the Second Five-Year Plan in regard to the study of the oil reserves of the territory of the U.S.S.R., we reach the following conclusions :—

(1) The old oil districts of the U.S.S.R. still need further intensive study, as they are continually revealing new wealth and achieving increases in the reserves of oil, despite the enormous quantities already obtained from them.

(2) The opening up, or rather, the conclusive establishment of the Ural-Volga region as a rich oil-bearing area, a "Second Baku," has radically altered the geographical distribution of the Soviet oil industry, and has improved it from an economic and strategic standpoint.

(3) The results of the geological investigation during the Second Five-Year Plan enable us to develop, with great confidence of success, geological-prospecting and geological-survey work for oil in the East of the Union, in Western Siberia and in the Far East, and also on the Russian Platform to the west of the Ural-Volga district, i.e., on the right of the Volga and within the limits of the Oka-Tsna and Alatyr traverses. The study of the oil-bearing possibilities of the Ukraine will be carried on intensively.

Expansion in Manchuria

As a first step towards the establishment of a permanent plan for the development of natural resources in Manchoukuo, a commission was dispatched jointly by the Governments of Japan and Manchoukuo in July this year.

Meeting at Hsinking with their respective reports in the early part of August, members of the party held a conference, as a result of which the existence of abundant natural resources in Manchoukuo was confirmed. It is expected that a synthetic plan will soon be framed for the exploitation of these natural resources, in conformity with the plan for similar developments in Japan.

Needless to say, the abundant natural resources of Manchoukuo will play an important rôle in the economic development of East Asia. At the same time, it must be admitted that the present shortage of technical forces and machinery, due to special war-time financial conditions, is hampering the progress of development.

In view of this situation a joint conference will shortly be held in Tokyo in order to re-examine the development plans of both Japan and Manchoukuo and to discuss matters covering the following main points:

(1) Because of the necessity to develop not only magnesite, molybdenum ores and other minerals, which are not found in Japan (but which nevertheless are considered indispensable), but also gold, silver, copper and other minerals which are favorably distributed, the present plans will be enlarged to meet these requirements.

(2) Almost all the iron mines in Manchoukuo produce low grade varieties, with the exception of one or two rich mines recently discovered. Their iron deposits, however, are very rich, and the question of how to deal with these numerous mines will accordingly become a subject of study in the future.

(3) Since coal production is, so to speak, an axis of the production capacity extension project for Japan and Manchoukuo, importance is attached to coal research. It is held that production of coal in Manchoukuo can be carried out on a favorable commercial basis in view of the fact that there are many virgin mines and abundant cokemaking coal. For this reason, therefore, importation of technique and machinery to Manchoukuo is considered necessary. It will also be essential to complete transportation and power supply systems as soon as possible. The current development plan of Manchoukuo, aiming at an annual production of coal amounting to 31,000,000 tons, will therefore, be still further extended in the near future.

Reclamation of Tidal Lands by Means of Dredged Spoil

By HERBERT CHATLEY, D.SC.(ENG.)M.INST.C.E.

The author of the following article, which is reproduced from The Dock and Harbor Authority, for many years was Chief Engineer of The Whangpoo Conservancy Board, at Shanghai, and in this capacity gained wide experience with the kind of work he described in reclaiming considerable areas near Shanghai in connection with dredging in the Whangpoo river, which flows into the Yangtze near Shanghai.

* * *

THE most satisfactory means of disposing of dredged material is to use it for raising low areas. In the best cases this serves some or all of the following purposes :—

(*a*) Creation of land values.
(*b*) Reduction of haul from dredging cut to dump.
(*c*) Improvement of channels by concentration of stream.
(*d*) Avoidance of bed accretion at dumping area.
(*e*) Avoidance of marine risks to dumping plant.

On the other side of the picture are the following objections, some or all of which may arise :—

(*a*) Excess of filling costs over market value of land.
(*b*) Large capital investment in containing walls or dry transport plant.
(*c*) Reduction of tidal magazine.
(*d*) Obstruction of channel by shore-discharging plant and vessels transporting spoil.
(*e*) Disturbance of land drainage.
(*f*) Legal questions as to title or easements, shore access and boundaries.
(*g*) Loss or reduction of foreshore use and shore access during reclamation.
(*h*) Reduction of berthage for lighters and sailing boats and annulment of fishing rights.
(*i*) Deflection of tidal currents by corners of reclamation.
(*j*) Temporary and limited character of the method.
(*k*) Slow consolidation of filled area and consequent delay of usure.
(*l*) Danger of injury of channel by failure of retaining walls.

Economic Aspects

As in most engineering problems, the decisive question is an economic one. The pros and cons under this head are mainly as follows :—

Pros :—	*Cons :—*
Increase of land value	Costs of containing walls and pumping plant or dry transport plant.
Reduction of haul.	Costs of shore protection.
	Cost of pumping over that of dumping.

It should be remarked that the work may be done in two ways :—

(*a*) Dumping (so far as water levels will allow) and deposition of " dry " material.
(*b*) Pumping of liquefied material into watertight basins from which the excess water escapes over a weir.

The " dry " process is usually an expensive one, as the plant must " dredge " the material from the containers which have transported it, and then carry it by telphers, belt or bucket conveyors, tipping trucks, or the like, all over the site. If the site is in deep water some filling can be done by dumping, but in such cases a front wall will be required to retain the material, unless it is sufficiently coarse not to flow or wash away.

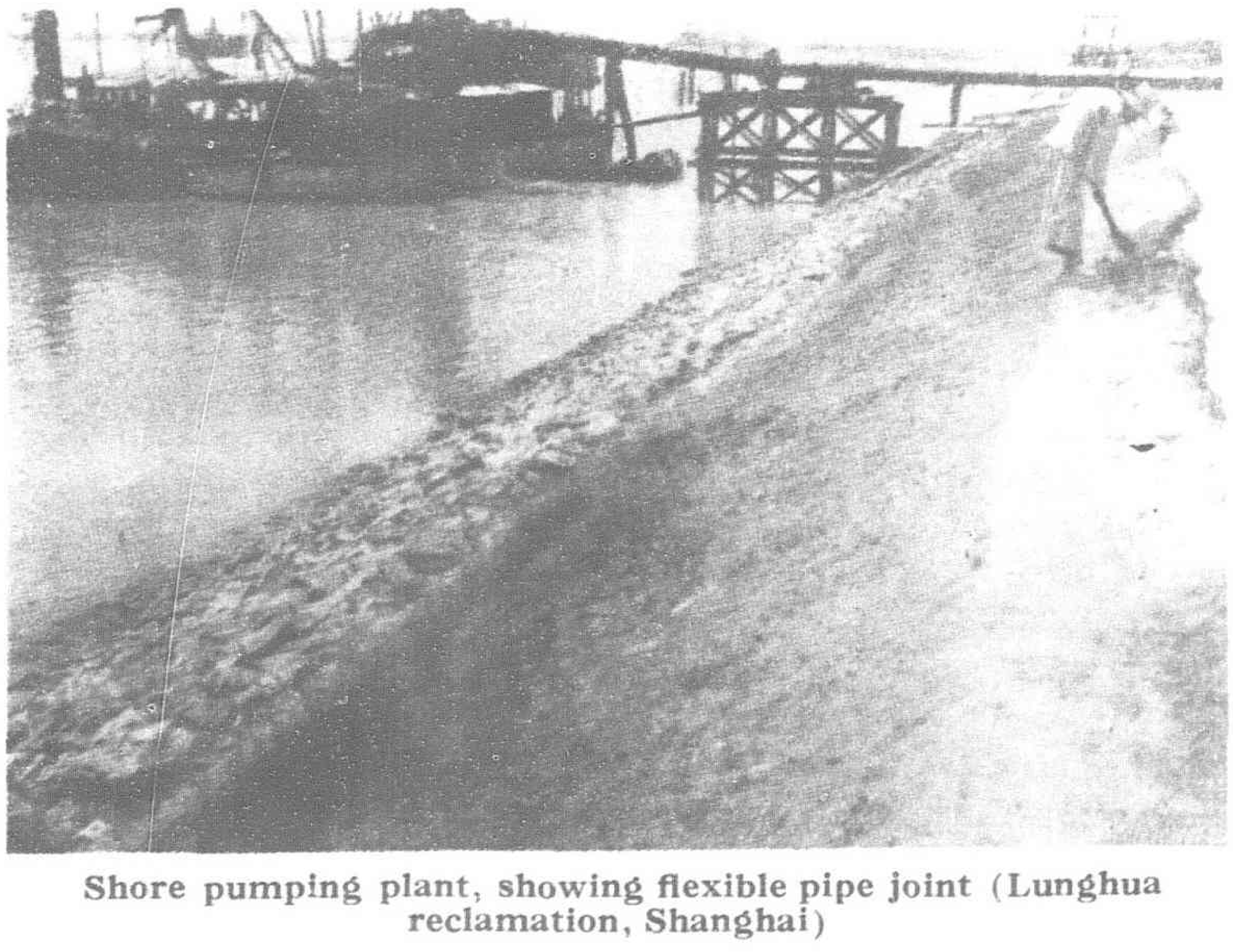
The liquefaction process is usual with alluvial materials, but the cost of the enclosing banks is a difficulty. To keep this down the basins must be large, which means a good deal to pipe work. Experience seems to show that such pumping within, say one mile of the pump, can be carried out for about 6d. per cu. yd. of *in situ* material, not including the retaining walls.

The cost of the retaining walls depends on the length, height, relation to water level, foundations and the exposure to weather. Provided suitable material for them exists nearby (often in the foreshore itself), such banks, above L.W. level, may perhaps be constructed at 6d. per cu. yd (*in situ*) of the spoil contained in the basin (not the cu. yds. in the banks themselves).

If now the cost of haul is, say, ¾d. per cu. yd. (*in situ*) of spoil per sea mile carried, this total of 1s. per cu. yd. will offset 16 sea miles of haul.

Thus if a foreshore of, say 300 acres, or say 1,500,000 sq. yds. is filled to an average of 3 yds. deep, it will take 4,500,000 cu. yds. of spoil. The retaining banks (including two cross walls and small banks at the back to prevent over-running the high land) may consist of, say, 10,000 yds. run of bank of an average sectional area of, say, 25 sq. yds., making a yardage in the banks of 250,000 cu. yds. Using the figure of 6d. per cu. yd. of basin content (4,500,000 cu. yds.), we have £112,500, or nearly 10s. per cu. yd. of bank, which should amply suffice to cover the work, including protection. If the banks are in deep water, the costs will be much higher.

As to the effect on land values, the gross cost of reclamation per acre is high, and it will rarely happen that, unless regard is had to savings in dredging costs, it can be borne. Thus in the above case, if the cost of pumping and dykework is 1s. per cu. yd. of basin content, and the fill is 3 yds. deep, the cost is 3s. per sq. yd. of reclamation, or £726 per acre. This is obviously the main reason why such reclamation is not popular, but in many cases this cost is less than that of the extra haul to a dump. Thus if the cost of haul saved is deducted and this haul is 24 sea miles = 1s. 6d. per



Shore pumping plant, showing flexible pipe joint (Lunghua reclamation, Shanghai)

Completed filling (quay wall being built outside) (Jukong wharf, Shanghai)

cu. yd., there is a saving of 6d. per cu. yd., plus the increased market value of the land.

Tidal Effects

The reclamation of a tidal foreshore may or may not be harmful to the hydraulic regime of the waterway. In so far as the volume occupied by the reclamation is between ordinary spring high and low-water levels, the storage capacity for tidal water is reduced, and the incoming tidal flux up to the reclamation tends to be lessened by this amount. On the other hand, the narrowing of the waterway causes a concentration of the tidal stream, so that as long as the reclamation is kept behind proper training lines the reduced volume may still be compatible with the pre-existing water levels and proper channel flushing. In river regulation it is often found, in fact, that reclamation carried out to the proper lines may not actually reduce the tidal flux, by reason of the better flow conditions (e.g., diminution of eddy losses at curves and shallows), so that tidal range is increased and flushing improved.

Land Values

A highly paradoxical state of things exists in England in regard to land. Unless it has potential industrial value there is very little demand for it, and, in fact, large areas have gone out of cultivation and are laying practically idle. This is doubtless to be associated with the dangerous degree to which England has developed its manufactures for export so that the majority of the population is dependent on agricultural imports. This situation will doubtless change, but in the meantime it seriously affects the value of reclamation for agricultural purposes. It is, in any case, true that the cost of enclosing works and spoil pumping per acre is generally much greater than the agricultural value of the land, so that unless these costs can be recouped by economies in haul, the proposition is not attractive. The question of water levels is rather important. The dyking in of the foreshores (without filling) enables natural or artificial irrigation of the land to be readily controlled, so that the meadows of the Thames Estuary or the paddy fields of Chinese rivers are not improved for agriculture by filling.

The situation is quite otherwise if the land is in demand for industrial or shipping purposes, and it may even happen in such case that the rentals or sale price will fully recoup the reclamation costs.

Associated with this question are the time of solidification and the nature of the soil.

Consolidation and Nature of the Soil

In the process of filling by the liquid process there is a sorting out of the finer particles, which run away at the discharge weirs with the excess water, so that if the spoil is of a sandy nature it quickly settles, providing a good foundation in a short time. If such fill is to be used for agriculture it may be possible to arrange for the surface fill to be of a fertile material.

Where the material dredged is largely of a clay-like character or contains organic humus, the problem is not so simple. While perhaps ten per cent or so of the material may run off as colloidal particles with the excess water, an appreciable amount of the fine stuff remains, and all the particles are so small that the squeezing out of the water under the weight of the filling material is a slow process. Terzaghi and Frohlich have shown that consolidation of thick layers of alluvium may take thousands of years, and Casagrande has shown that condensed artificial slurries may have much less solidity than slowly-formed natural alluvium owing to the formation of special grain structure in the latter. In the Whangpoo River at Shanghai, where some square miles of reclamation have been made by liquid filling, it is generally found that the surface of such fill has a crust of about 1-ft. in thickness a year after filling, increasing by about 1-ft. per annum, so that while it can bear moderate surface loads within two years, structural foundations must be carried on piles down into the natural material below. The speed of consolidation can be increased by the use of land drains or by the use of small quantities of flocculants, such as alum.

Filling Levels

There is a strong temptation to the engineer in charge of spoil disposal to raise the filling to a high level so as to concentrate the maximum quantity of spoil on to a given area. This may be very disadvantageous in respect to the subsequent use of the land. Even from an agricultural point of view, it has objections, since such land will perhaps dry out too quickly. For industrial or shipping purposes, the finished level at the water's edge certainly should not be more than, say, one or two feet above extraordinary high-water level, as otherwise great effort will be required to raise goods from water level to the ground. If the reclamation is large, there is no objection to the parts remote from the water's edge being raised several feet above the extraordinary high-water level, with a gentle slope towards the water's edge. How far this is practicable depends on the pressure of the spoil pump.

Construction of Retaining Walls

Since the major part of the cost of reclamation is in the building of the watertight containing walls, every effort must be made to utilize economical methods of construction for them. Should it be intended that the front wall is to be used for shipping purposes, naturally forms, including sheet piling, with anchor plates and rods, masonry or concrete walling may be considered, but from the reclamation point of view, these are not to be compared in cost with simple dykes, and are not correctly chargeable in their entirety against the cost of reclamation.

On a mud or sand formation, with a brushwood mattress foundation up to ordinary spring low water, and a rubble stone toe dyke up to, say, neap low water, a clay bank will generally serve, unless the spring tidal range is over, say, 20-ft. For somewhat greater ranges the stability can be increased by enlarging the toe dyke, flattening the slopes or inserting berms, and if necessary, incorporating some gravel or ashes in the banking material. A good practice is to make the front slope one in two, and the back slope, say, one in three, with a 3-ft. top.

The front slope is protected during the work with a layer of reeds, held down by brushwood ropes pinned into the dyke with stakes, and covered with rubble. After the filling is complete and the dyke fully settled, this is stripped and replaced with carefully hand-packed rubble on sand, or a cemented stone pavement of hammer squared stone.

The dyke is raised to about 1½-ft. above the filling level to allow for settlement and surging in the basin. Thus, if the dyke is 20-ft. high, built on a fairly level bottom at spring low water, a 30-ft. mattress, 2-ft. thick, under the front edge, with a stone toe dyke up to 5-ft. above spring low water, the quantities and cost are somewhat as follows, per foot :—

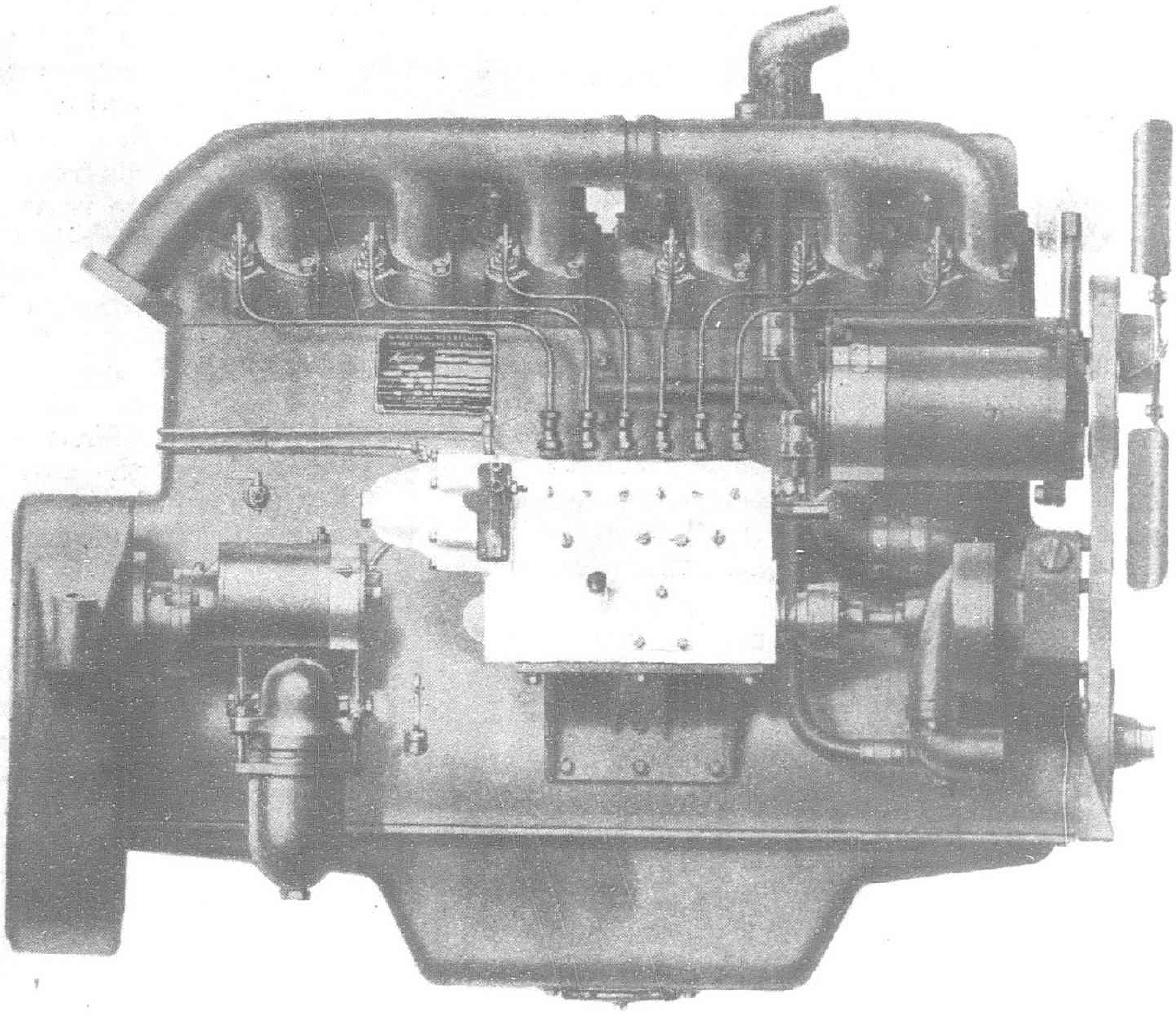
	£	s.	d.
1,060 cu. ft. of earth=say, 40 cu. yds. at, say, 2s. ..	4	0	0
36 cu. ft. or rubble stone for toe dyke=1½ tons at, say, £1	1	10	0
30 sq. ft. of mattress, 3-ft. thick, consolidated to 2-ft.= 3⅓ sq. yds. at, say, 12s.	2	0	0
Temporary protection.—33 sq. ft.=3⅔ sq. yds. at, say, 10s. 6d., say	2	0	0
Permanent protection.—33 sq. ft.=3⅔ sq. yds., at, say, 30s.	5	10	0
	£15	0	0
Supervision, etc. ..	5	0	0
	£20	0	0

(Bank volume being 40 cu. yds., this equals 10s. per cu. yd., as given before).

The lateral, rear and partition dykes will be less expensive, being of smaller average height and needing less protection. The excess water is run out through pipes built through the dykes and entering timber sump boxes, having on one side an adjustable weir. The pipe line is carried on rough trestles on light temporary piling. At the junction with the spoil pump, a strong platform is required to carry the telescopic swinging joint required to allow for the tidal rise and fall of the pump, with heavy temporary guide piles for the pump.

The getting of suitable clay for the dykes sometimes presents difficulties, as economy requires the haul should be a minimum. In some cases light temporary dykes can be put up on the foreshore, made with the foreshore material, and the bank material procured from the borrow pits so enclosed. Light runways on trestles are then used to carry the material to the actual bank site. Alternatively or supplementarily, the material may be carried to the site by boat at high water and dumped.

Waukesha Multi-fuel, Poly-cycle Engines of Unique Design



Showing six-cylinder truck engine of new design

Announced at the recent World Automotive Engineering Congress by J. E. DeLong, President of the Waukesha Motor Company, was a new line of engines that will eventually supersede existing standard ell-head engines for truck and bus service. These new engines, known as the Multi-fuel, Poly-cycle type are unique in their basic design. Intended for use with oil, gasoline, butane, or producer or natural gas, every engine in this series is convertible after its manufacture by simply changing the fuel burning accessories.

It was discovered after nearly ten years' development and refinement of the Hesselman type of spark ignition oil engine for industrial purposes that by a re-arrangement of the manifolding and a re-location of injection and spark plug equipment this oil engine could be equipped with carburetor and become a very efficient gasoline engine. And while conversions of industrial engines from Diesel oil to natural gas have been common practice in the oil fields for several years past, the plan to combine the manufacturing economies of quantity production on gasoline engines with the oil engine production was only decided upon after a survey of the truck and bus field showed that operators were unable to adopt the Diesel engine in many cases because of the inherent sizes and weight as well as the high first cost. Of nearly four and a quarter million highway transport vehicles registered, scarcely one-tenth of one per cent of them are using oil engine. Furthermore, 3,800,000 are trucks of two tons or less capacity so that an expensive, bulky, and heavy oil engine can seldom show an economy in such service.

It is expected that the manufacturers of the Multi-fuel, Poly-cycle engine can overcome most of the objections in this field as well as in the larger field. Since none of the internal mechanism is changed and the engine is basically the same except for fuel accessories, its weight as an oil engine is only a few pounds greater than its weight as a gasoline engine, and its weight as a gasoline engine is exactly on a par with gasoline engines of equivalent size and power in to-day's conventional design.

Among other advantages claimed for these engines are greatly reduced maintenance and service costs because of the absolute interchangeability of service parts as between gasoline and oil engines and the large quantity production. Rods, bearings, pistons, rings, pins, valves, camshafts, crankshafts, crankcases, cylinder heads, in fact all of the major parts, are the same whether the engine is an oil engine or a gasoline engine.

Illustrated is the first of a series of six-cylinder truck engines of 525 cubic inch displacement. The engine has six cylinders $4\frac{1}{2}$-in. by $5\frac{1}{2}$-in. with a 3-in. seven-bearing crankshaft, and an output of 125 h.p. at 2,100 r.p.m. When built as a gasoline engine, the elbow air horn on the intake side is replaced with a carburetor. In this case, the injection equipment on the opposite side of the engine is omitted, and in place of fuel nozzles are inserted screw plugs of equivalent volume so that the compression ratio of 5.8 : one is maintained. Fuel economies on Diesel oil of .5 pounds per horsepower hour have been obtained, and slightly better fuel ratings have been obtained on gasoline. A complete table of sizes of vital parts and specifications follows:

MODEL 140 HK. (FUEL OIL OPERATION)

Bore	$4\frac{1}{2}$
Stroke	$5\frac{1}{2}$
Displacement, cu. in.	525
Valve Diameter, clear—intake	$1\frac{3}{4}$
Valve Diameter, clear—exhaust	$1\frac{1}{2}$
Connecting Rod Bearing, dia. × lgth. ..	$2\frac{3}{4} \times 2$
Front Main Brgs., dia. × lgth.	$3 \times 1\frac{7}{8}$
Center Main Brgs., dia. × lgth.	$3 \times 3\frac{3}{16}$
Inter. Main Brgs., dia. × lgth	$3 \times 1\frac{7}{8}$
Rear Main Brgs., dia. × lgth.	3×3
Piston Pin, Floating, dia. × lgth.	$1\frac{3}{8} \times 4\frac{1}{8}$
Compression Rings, width (3)	$\frac{3}{16}$
Oil Control Rings, width (1)	$\frac{1}{4}$
Timing Gears, Face	$1\frac{1}{2}$
Std. Flywheel Housing, S.A.E. No.	3
Exhaust Manifold Bore	$2\frac{1}{2}$
Fan Diameter (extra)	20
Wt., equipped for fuel oil operation	1,340 lbs.

(All dimensions given in inches unless otherwise specified).

Cylinder Heads—Twin castings, with water cooled exhaust ports cast integral, interchangeable front or rear. Injector nozzles and spark plugs carried in cylinder head.

Crankcase—Crankcase and cylinder frame in one unit. Heavy top and bottom diaphragms with baffles and ribs for directing water circulation. Crankshaft carried in upper half.

Cylinder—Removable wet type cylinder sleeves of Waukesha Molychrome iron.

Pistons—Cast iron, heavily ribbed with four rings, all located above the bearing bosses. Full floating pin. Aluminium pistons are available at additional cost.

Crankshaft—"Proferal." Seven main bearings.

Connecting Rods—Rifle drilled, S.A.E. 1045 heat treated steel. Large end ground to receive replaceable steel backed, babbit-lined, precision bushings. Finished rods matched in sets to $\frac{1}{4}$ oz. Piston pin floats in hard bronze bushing.

Main Bearings—Replaceable, steel-backed, babbitt-lined, precision bushings.

Valves—Placed in cylinder head. Intake—chrome nickel; exhaust—chrome silicon. Hardened heat resisting inserts in exhaust valve seats.

Valve Tappets—Mushroom type. Entire valve mechanism enclosed and flood oiled.

Timing Gears—Helical cut gears of mild steel. Fully enclosed and flood oiled.

Cooling—High duty water pump delivers large volume of water in directed paths. Large, clear passages surround valve seats.

Lubrication—Full pressure oiling by positive gear-type pump. Oil is forced through large drilled passages to each main, camshaft, connecting rod, piston pin, rocker arm, oil pump drive shaft bearing, and to idler gear stud and gears. Valve mechanism and cylinder walls are drenched by oil mist. Oil inlet surrounded by strained and oil level equalizer which prevents air-bound lines and insures lubrication at all oil levels and temperatures. Pressure adjustment possible while engine is operating. Large filler openings protected by hair filled breather cap. Simple, bayonet-type, oil level gauge. Rear sump oil pan is standard.

Oil Filter—Extra large capacity, waste packed, lubricating oil filter is mounted on crankcase, shunt connections.

Flywheel Housing—S.A.E. No. 3 standard, No. 2 extra.

Fuel System—Single unit, six plunger, solid injection pump with special Hesselman nozzles and drawn steel high pressure lines.

Ignition—Mallory special oil engine battery ignition available when electric starting equipment is used. Bosch heavy-duty magneto will be furnished when electric starting equipment is not used.

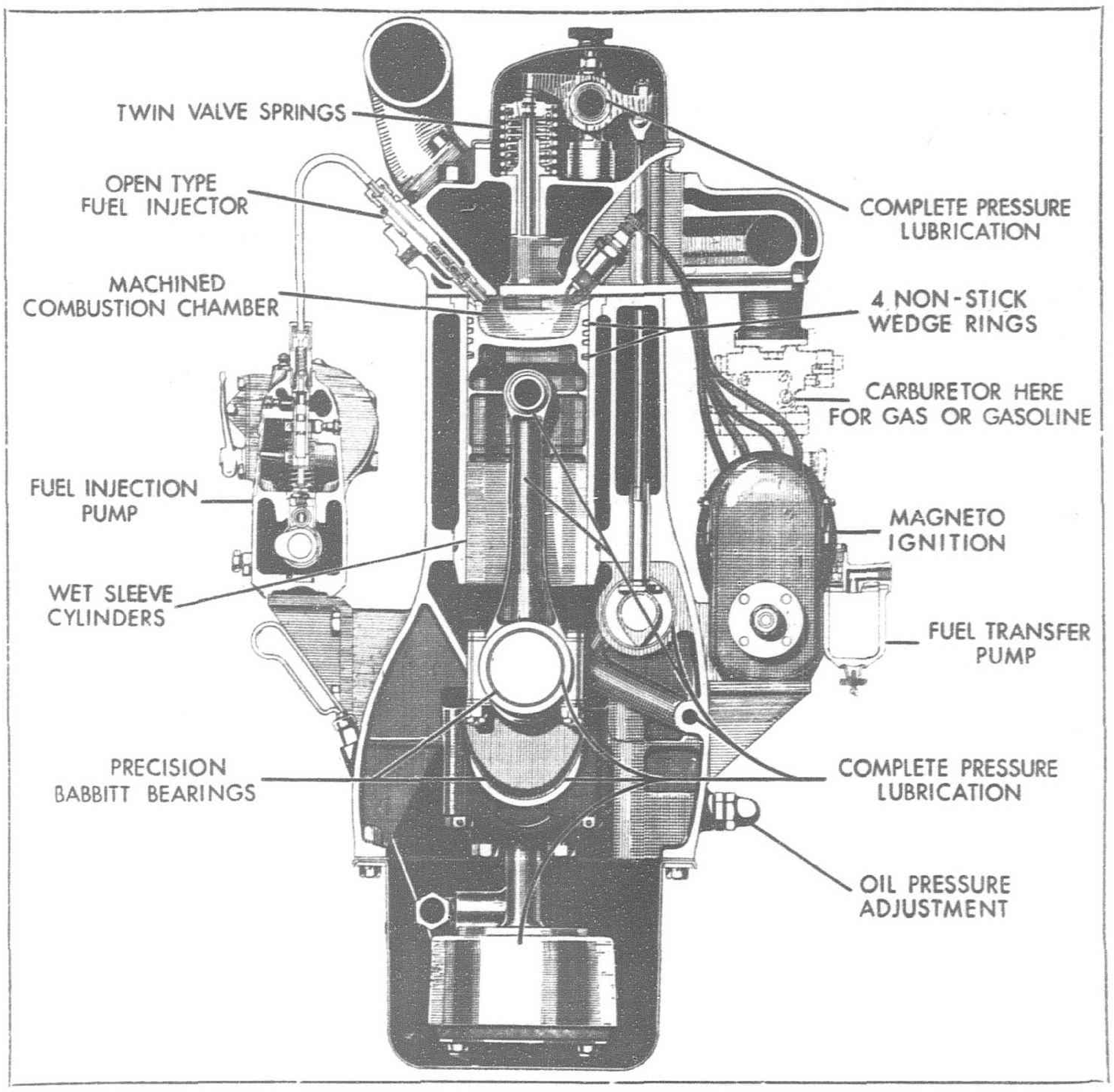
Governor—Waukesha built-in centrifugal governor, enclosed, self-lubricated and non-hunting. Positive gear drive from timing gears limits the speed. Special manual speed control equipment can be supplied at additional cost.

Fuel Feed Pump—Positively driven fuel feed pump delivers fuel from storage tank to injection pump.

Primer—Gasoline primer and tank for starting only.

Fuel Filter– Waste type. Filter has provision for replaceable or repackable elements.

Other engines of this same type will be available to complete the line as fast as arrangements for their production can be made. They will include two fours 3¾-in. by 5-in. and 4-in. by 5-in., and six sixes 3¾-in. by 5-in., 4⅛ by 5-in., and 4¼-in. by 5½-in., 4½-in. by 5½-in., 4¾-in. by 6-in., and 5¼-in. by 6-in.



Design showing working parts of new Waukesha engine

American Trade and the War

(Continued from page 448)

domestic purchasing power is probably more important. Schedules of Fall assemblies are based on optimistic views of the outlook, and the industry is expected to be in full swing on 1940 models by the middle of October, with a probable output of 400,000 cars a month thereafter.

Demand for non-ferrous metals and metal products has been heavy, and early in the month 130,000 tons of copper was sold in five days. Producers since have limited sales. Coal, which will benefit from industrial revival and probably greater export demand, has advanced in price and production is climbing rapidly, already up to almost 9,000,000 tons weekly, the best since early 1937. Electric power production has set two consecutive all-time records.

Finally, railway freight car loadings have exceeded all predictions, and totaled 815,000 in the week ended September 23, with the Fall peak still to be reached. The railroads have had to race to repair equipment to take care of this unforeseen traffic. According to *Railway Age*, the number of freight cars in serviceable condition represents 3,000,000 tons less carrying capacity than in 1936, and there were small car shortages in 1936-37 period, with peak loadings less than 850,000 cars a week. However, the American Railway Association is confident that by prompt handling the traffic can be carried without hampering business. Meanwhile the roads have rushed equipment orders, which are an important factor in the steel improvement. On the above indications of car loadings, they may have better earnings than in the Fall of 1936, and possibly spend more on equipment than they did then. These orders will be in production for months to come, irrespective of foreign developments.

In Conclusion

The foregoing is an impressionistic summary, all portraying a sharp rise; and at the moment there are hardly any reports of the opposite character that could be offered to tone the summary down. Evidently the increase in production that has set in during September still has strong momentum, and will carry further, with the 1936-37 peak within reaching distance. The best level of the Federal Reserve Board's index of industrial production during that recovery was 121 in December, 1936; while in August of this year, before the turn-around, the index was 102.

It is not too early to consider what the situation will be if the rise in production is as sharp as indicated. For the next step, the goods will have to pass into consumption, and while consumption will naturally increase, along with greater industrial employment and higher farm income, there will inevitably be a period during which inventories mount; and in that interval productive activity may be vulnerable to a relapse again. In many products what has occurred thus far is not an increase of consumpion, but a shift of existing stocks nearer the consumer, from manufacturer to distributor, and from the producer of the raw material to the manufacturer. So far retail sales have shown no pronounced improvement over the August level, which, however, was somewhat better than in July.

Business men know that after a spurt of heavy buying and increased production a let down is usual. There was such a reaction in the latter part of 1933, after the Summer rush, and early this year, after the upswing in the Fall of 1938. The real question is "How different is the situation now?" What influences can carry business continuously forward? On the favorable side, increased exports in some lines should help to absorb the increase in production; the tendency will be to carry larger inventories because of the conviction that the long trend is upward; and investment in plant and equipment should pick up. Unquestionably as production rises old plants have to be modernized and facilities extended. The railway equipment business already developing is an example. The utilities will spend more money on plant.

For the present, however, it would be futile to attempt to measure these influences precisely, and to predict whether they will absorb the increasing production, validate the price rises that have occurred, and fend off the reaction. The answer will have to be sought in the industrial and trade reports, and the war news, of the coming months.

Agricultural Hydraulics in Indo-China

By ANDRE ARTONNE, President of the British Section: Conseillers du Commerce Exterieur de la France in The Asiatic Review

FROM a colonizing experience acquired through continuous effort in all four quarters of the world, France has evolved certain vital principles which have enabled her to build up a lasting work on solid foundations. This has been done by associating the Native with the European in the pursuit of a common aim. Joint responsibility, therefore, constitutes the main precept of French doctrine which insists that the colonizer must act first and foremost for the good of the colonized.

Among all the problems facing France at the time of the occupation of Indo-China, there was none more urgent than that of a water-supply, for it was closely bound up with the demographic question. It was, in fact, a matter of assuring subsistence to an ever-increasing population whose unequal distribution left vast regions desert, while huge masses of people were packed together in the delta zones, which, though fertile, were limited in size, badly equipped and periodically devastated by floods and famine. Albert Sarraut, a former Governor-General of Indo-China, has written as follows on this subject: "Throughout large areas in many parts of Asia formerly arid, a new teeming, seething population is clamoring for the fulfilment of its needs—the provision of an ample food supply. Are these huge untilled tracts of land out of which organized regions might be created to be left to lie waste? Are they to be abandoned to ignorance and incompetence?"

To appreciate the problem in all its magnitude, we must look at a map of this great French possession in the Far East.

The peninsula of Indo-China consists of a group of mountain ranges and tablelands which rise to a height of more than 9,000 feet on the Chinese frontier and on the flanks of which rivers have, in course of time, formed alluvial plains. The Annamite range which divides Laos from Annam forms a rugged arc composed of a series of plateaux. The plains are of two types: the plains of the interior, extensive, monotonous, very thinly populated, and the alluvial plains of the coast, constituting over-populated zones of intense activity.

In the north are the deltas of the Red River and of the Thai-Binh; in the south is that of the Mekong. Along the whole of the Annam coast there is a succession of much smaller deltas. Three-quarters of the inhabitants are gathered together in the maritime plains which represent a tenth of the total surface of the country.

Geological and hydrographic researches have established the fact that the deltas of Tonkin and Annam are situated where formerly there were gulfs, slowly filled up in the course of ages by upheavals of from eight to ten meters, of which the last would be comparatively recent. Gradually, regular off-shore bars were formed, whose present limits approximate to those of the bays, the final filling up of which was the work of the alluvial masses brought down by the rivers. To mention only the Red River in Tonkin, the weight of the silt it carries down when in full flood amounts to from three to seven kilogrammes per cubic meter, which is more than that of rivers of such great length and volume as the Nile and the Mekong. This accumulated silt is soon transformed into a foreshore which the natives enclose with dykes so as to turn them into rice-fields. The Tonkin delta is 16,000 square kilometers in size.

The appearance of the Cochin-China delta formed by the Mekong is altogether different. Unlike that of Tonkin, work on it has hardly begun and vast stretches are left for native colonists to cultivate. Perhaps its development will prove to be the real solution of the disturbing demographic problem arising from the over population in the north. The arms of the Mekong and of the neighboring rivers are connected by numerous natural arroyos and by artificially constructed canals. The tide penetrates into these channels at both ends and deposits mud in the arroyos whose beds are continually being raised in the center. During the floods, that is from June to October, the rivers become too full to stay within their banks and inundate the surrounding country.

The work of man has brought under cultivation a large part of the plains which receive the fertilizing silt—this is the richest part of Cochin-China, its rice granary. But immense regions can be gradually developed; there is first of all the Plaine des Jones, with its 700.000 hectares, and there is then the Plaine des Oiseaux in Western Cochin-China, with its 1,800,000 hectares, now almost covered with marshy forests and swamps.

The study of agricultural hydraulics in Indo-China has three main aspects: the construction of dykes, the draining of low-lying lands and the irrigation of high lands.

From time immemorial, the former Emperors of Annam attached the utmost importance to the construction and maintenance of the dykes. History and legend have left numerous evidences of the interest they took in works of this kind, and the Gia-Long Code provides a whole series of punishments to be applied to mandarins who out of negligence or ignorance left the dykes in a bad condition.

It is generally admitted that the construction of the dykes was begun—at any rate in Tonkin—in the thirteenth century under the Tran dynasty, although certain Chinese documents give grounds for the belief that this undertaking dates back to a much more remote period. But the history of the Red River which, in spite of its volume, preserves a torrential character for the greater part of its course is nothing but a long tale of catastrophes due to floods.

In 1885, at the time of the French intervention, the system of protection designed by the Annamite sovereigns closely encircled the Tonkin delta, but it had grave defects. The dykes reached an average height of only nine meters, while the Red River in flood could rise to 11 meters 93 centimeters. Moreover, there had, at the beginning, been no conception of the scheme as a whole, and owing to lack of proper engineering, there was only a weak protection against the inroads of the water. In the flood seasons, watchmen were posted at danger points. If a breach occurred in the earth wall supposed to withstand the force of the floods, the local authorities requisitioned the entire population of the neighboring villages—men, women and children—to cope with the catastrophe with the poor means at their disposal then. They fought foot by foot, for days on end, against the advancing waters, piling baskets and sacks filled with earth against the cracks. These miserable shifts were generally of no use and served only to delay the fatal moment when the rushing river poured over the low-lying lands, rendering all their efforts futile.

The Protectorate, assisted by all the powerful resources of modern engineering, carried on the work begun by the Emperors of Annam.

The task was a formidable one: it was approached by tackling what was most urgent, namely the strengthening of the large dykes bordering the Red River and its effluents. But the successive improvements made here were still inadequate and there were frequent breaches from 1905 to 1926. In that year, the late Albert Pouyanne, the then Inspector-General of Public Works, put through a new program costing 9,600,000 piastres or 96,000,000 francs. Its magnitude can be seen from the following figures: the volume of the Tonkin dykes, which was approximately 20 million cubic meters on the arrival of the French in the country, reached 32 million cubic meters in 1915, 48 million in 1926 and 87 million in 1938.

Since 1926, no breach has been recorded in the Red River basin although the floods of 1936 and 1937 attained a higher level than had been hitherto anticipated.

This work completed, a second program was adopted in connection with the Thai-Binh basin on the banks of the three rivers: Song-Cau, Song-Thuong and Song-Luc-Nam which unite at Sept-Pagodes to form a single short waterway, branching out almost immediately afterwards into a delta adjoining on the north-east that of the Red River, with which it is connected by two effluents from the Red River, the Canal des Rapides and the Canal des Bambous.

The old-fashioned dyke construction of the Thai-Binh having proved inadequate in times of exceptional floods, recourse had to be taken to methods which had been tried out in the Red River basin. The modern type of dyke construction exhibits the following characteristics :

Formation level from five to six meters wide with a height of 1 to 1½ meters above the highest known flood level.

Watertight lining of the sides of the river about 2½ meters in thickness.

Widening by footways wherever circumstances permit.

The works were extended in 1938 to the value of 5,000,000 piastres or 50,000,000 francs, necessitating the employment of 20 000 coolies.

In Annam, the rivers are subject to annual flooding, but owing to the small area of the basins, these floods are not nearly so serious and therefore less disastrous than those of the Red River in Tonkin. The same is true of Cochin-China where the question of dyke construction does not arise, the waters of the Mekong being allowed the same freedom as those of the Nile.

As regards irrigation works, these, as was said earlier, fall into two distinct categories : the drainage of low-lying lands and the irrigation of high lands. The problem has an entirely different complexion according to whether it concerns Tonkin, Annam or Cochin-China.

In Tonking, the works undertaken affected two different types of land : those of deltaic formation in the maritime zone and those inside reservoirs formed by the dykes of the Red River and its effluents. The first had to be protected from the salt water and their surplus fresh water had to be drained off. This was effected by the construction of dykes on the foreshore along the coast and by means of flood gates functioning at low tide.

These works were completed by the cutting of irrigation canals which have resulted in the development of 25,000 hectares in certain maritime reservoirs.

The lands in the second category were surrounded by dykes which protected them from the neighboring river floods, but provision had to be made for the evacuation of the surplus rain water.

The clearing and draining works having proved inadequate, a great undertaking called the Day Barrage, near the confluence of the Day and the Red Rivers, was begun in 1927 and finished on July 7, 1937. This dam is one of the most important in the world.

It forms part of a system of hydraulic development which aims at ensuring, on the one hand, the draining off in summer of surplus rain water to allow 50,000 hectares of low-lying land to be brought under cultivation, and, on the other, the irrigation of this same land during the winter. With this double end in view, the following undertakings have been envisaged : the construction of a dam on the Day, effluent of the Red River and, by development of the existing thalwegs, the creation of a drainage system, whose chief canal 65 kilometers long involves the excavation of 8,500,000 cubic meters, to drain away the rain water.

Finally, the construction of a water-catchment on the Red River above the reservoir and of a communicating irrigation and drainage system for the chief canals, to ensure by means of gravity the necessary supply of water for the crops of the fifth month to the drained lands, which thanks to the aforementioned undertakings have already harvested the crops of the tenth month.

The chief features of the Day Barrage are as follows : It has artificial foundations on sand like the big dams of India and Egypt (Nag-Hammade) with a great base providing a long line of infiltration (135 meters) so as to avoid destruction by undermining. Its total length is 260 meters. It has seven sluices, each with a " roof system " gate which can be operated without mechanical power. The opening and the closing are ensured by the action of the water of the Day itself. This is, actually, the system employed in Switzerland and in America, but there are only two examples of it in France—and these are much less important—at Tours-sur-Marne and at Nancy. The dam has necessitated the employment of 31,000 cubic meters of concrete, 2,000 tons of steel, 57,000 cubic meters of puddling clay, 30,000 cubic meters of enrockment and 288,000 cubic meters of earthwork.

The total cost of the entire hydraulic system, of which the barrage forms a part, will amount to 6,000,000 piastres or 60,000,000 francs.

What advantages will the native population derive from it ? The increase in rice that may reasonably be expected can be estimated at 900,000 quintals for the harvest of the tenth month and at 100,000 quintals for that of the fifth month, a total of a million quintals. So the reservoir will supplement the annual harvest to the value of 2,500,000 piastres or 25,000,000 francs.

The Day Barrage is one of the finest engineering works that has been created so far. It shows that, thanks to Western science, the fertilizing but often capricious waters of Tonkin can be disciplined for the good of the natives.

In Annam, the improvement due to irrigation is equally remarkable. Most of this territory is a narrow strip hemmed in between the Annamite mountains and the sea.

In the province of Vinh (North Annam) the Do-Luong dam was completed on June 2, 1937. This is a very important work requiring 64,000 cubic meters of concrete, 29,000 cubic meters of stones and enrockment, 2,272 tons of steel and 9,700,000 working days. It should supply 37,000 liters per second ; the average yield of a rice-field should be increased from 900 kilogrammes to 1,650 kilogrammes per hectare and the average tonnage of the paddy harvest in the irrigated zone should be raised from 39,000 tons to 112,000 tons a year.

In Cochin-China, the problem of drainage was invested with a special importance. Actually, Western Cochin-China is the perfect type of deltaic country ; moreover it is mainly situated between two seas with different conditions, hence the complex nature of the flow of the waters.

The seas washing the coasts of Cochin-China have an amplitude of from two to three meters, so, if the tide could freely penetrate inland, huge surfaces would be periodically covered with water. But thanks to the land folds along the coast and to those along the manifold arms of the Mekong, the tide penetrates only a small distance ; on the other hand, the local rain water and the river water that has overflowed find difficulty in draining off. The problem for the engineers was to utilize the movement of the tides to regulate the water level.

The first step was to establish a system of levelling. The second was to raise the level at certain points, so as to deduce from observations the laws governing water propagation. On the basis of these observations a huge system of canals was constructed. The canals have a two-fold object : to regulate the flow of the water for rice cultivation, and to open up communications with the big factories of Cholon and the port of Saigon.

Two regions in particular needed attention :

(1) The region between the right bank of the Mekong, from Chaudoc to Lonxuyen and the Gulf of Siam, whose lands were inundated every year by the waters of the Mekong. The problem here was how to obtain a rapid evacuation into the Gulf of Siam.

(2) The Plaine des Joncs, to the north-west of Saigon, between the left bank of the Mekong and the Vai-Co where the flood waters remained standing, causing the formation of a vast swamp. The solution was sought in the opening up of canals running from east to west, connecting the Mekong with the Vai-Co.

The dredging operations undertaken in the low-lying region of Cochin-China are an imposing work. More than 650 kilometers of major canals and 2,500 kilometers of minor canals have been cut ; and 180 million cubic meters of earth have been dredged. Thus the surface given up to rice cultivation in Cochin-China has increased from 700,000 hectares in 1890 to 2,111,000 hectares in 1936. A new program in connection with the development of the inundated lands is in hand at the present moment.

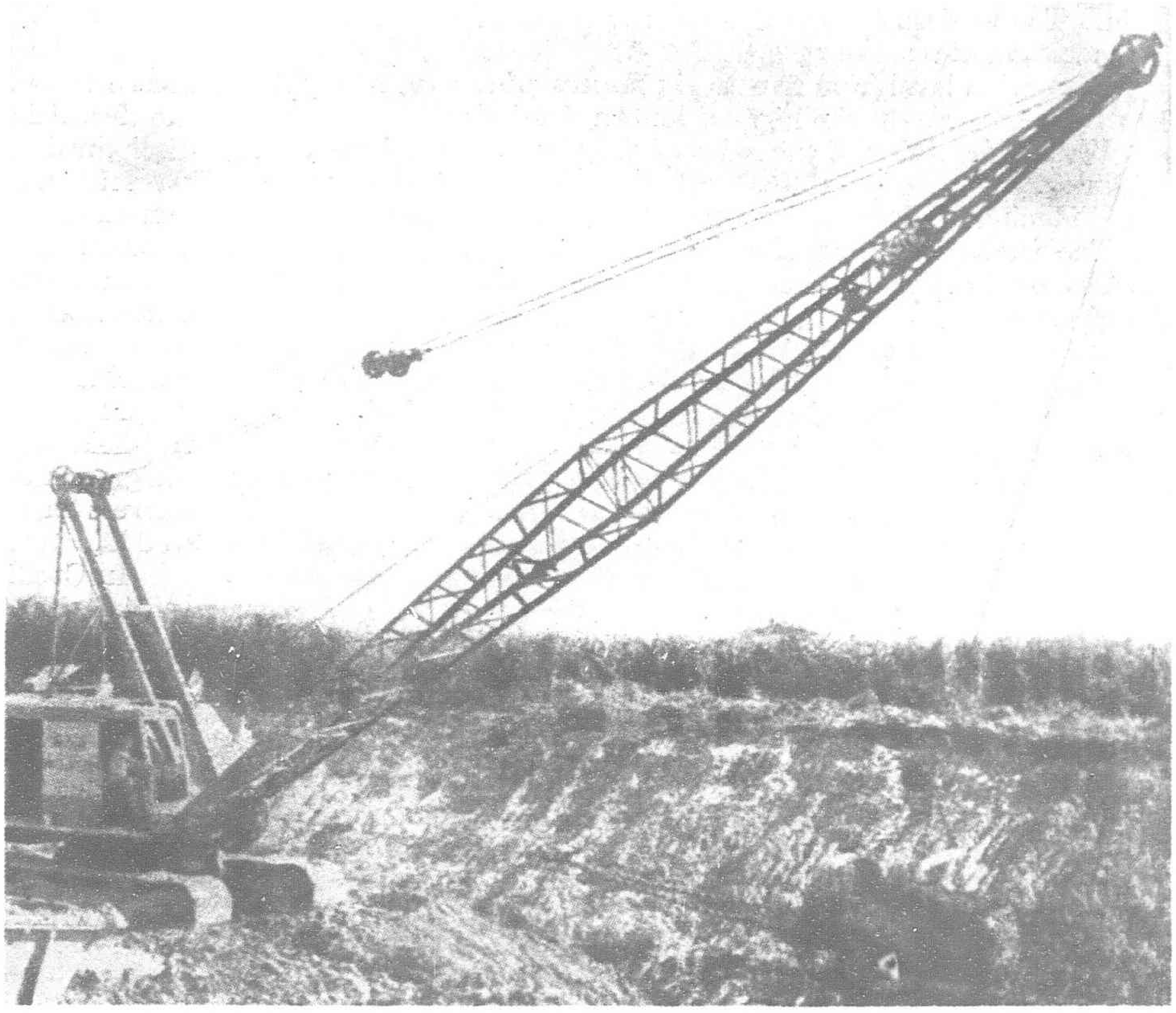
The great attention paid to agricultural hydraulics in Cochin-China can be seen by glancing at the figures relating to the export of rice from the port of Saigon during the last thirty years. These exports show a steady rise. The annual average each decade since 1875, shortly after the establishment of the French in Cochin-China, are as follows :

1875 to 1884	inclusive, annual average ..	360,000 tons.
1885 to 1894	,, ,, ,, ..	514,000 ,,
1895 to 1904	,, ,, ,, ..	734,000 ,,
1905 to 1914	,, ,, ,, ..	919,000 ,,
1915 to 1924	,, ,, ,, ..	1,200,000 ,,
1925 to 1934	,, ,, ,, ..	1,344,000 ,,

The program of works for Cochin-China should extend to 1950. When it has been completed the development of 500,000 hectares will be possible, and the total area of rice-producing land will be 2,500,000 hectares.

Such are the chief aspects of the human problem, in the different parts of the Union of Indo-China, which France has set herself to solve.

Bucyrus-Erie Offers New Diesel-powered Convertible Shovel



Illustrating operating range of the new Bucyrus-Erie convertible excavator

A NEW excavator that offers the rugged strength of the larger heavy-duty quarry and mining machines combined with the speedlined design and mobility found as a rule only in machines of smaller capacities is now being offered by Bucyrus-Erie Company, South Milwaukee, Wisconsin. It is the 2½ yd. 54-B, a Diesel-powered convertible shovel, dragline, clamshell, lifting crane.

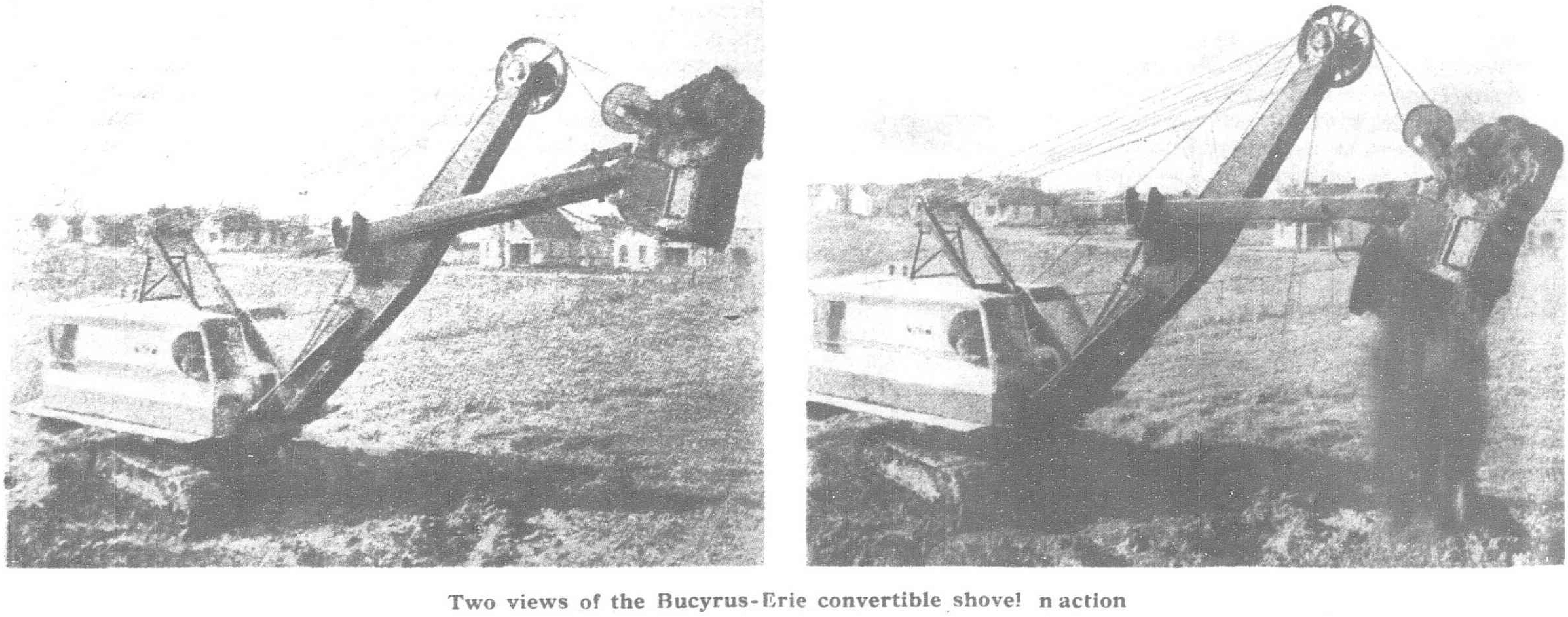
With husky quarry-type boom, wide outside dipper sticks, modern welded heavy-duty dipper, and positive independent crowd, the 54-B shovel front-end is the same type used so successfully on the 4, 5 and 6 yard Bucyrus-Erie quarry and mining shovels. Yet the machine is so compact that it comes within clearances of most U.S. standard gauge railroads and can be shipped without major dismantling. Clearances are reduced, and the center of gravity lowered, by combining roller path and swing rack in the truck frame casting; center pintle and the heavy reinforcements necessary to support it are eliminated by the use of single plane conical hook rollers; A-frame is arranged so that it can be easily lowered without dismantling the cab; and all excess weight is eliminated by the use of special modern, high-strength, light-weight alloy steels. Consequently, the 54-B offers a compactness and mobility which, the manufacturer claims, has never before been found in a machine of such large capacity.

Revolutionary in their simplicity, the new 54-B clutches set new standards in smooth, cool operation. Few parts, interchangeability of bands, and easy accessibility mean few adjustments, easy maintenance. Easy to operate, these clutches give the operator the "feel" so necessary to fast operation.

Accessibility for maintenance and adjustment has been a major concern of the 54-B's designers. The entire right side of the cab is free of machinery, and a roomy cross-aisle between engine and main machinery provides ample space for making adjustments easily and quickly. In addition, the 54-B boasts many features contributing to ease of on-the-job maintenance. For example, the drive shaft is in two sections; hence either section of the shaft can be removed without disturbing the other. This convenient accessibility plus the machine's rugged strength keeps "time-out" at a minimum, so that more time can be spent in actual digging.

Ratchet type chocking brakes provide quick free move-up for either dragline or shovel, with automatic looking against the pushback of the digging action. For dragling work on soft ground extra-large tapered "swamp cats" are available. An independent power boom hoist makes the 54-B an efficient machine for crane and clamshell service. If desired, an electric drive can be substituted for the Diesel power unit.

Not a mere refinement of older model excavators, the 54-B is a new machine from the ground up. Since space permits mention of only a few of its revolutionary features of design and construction, get a complete description of this amazing new 2½ yd. excavator. Write to this magazine or to Bucyrus-Erie Company, So. Milwaukee, Wisconsin, and ask for Bucyrus-Erie Bulletin No. 54-B1.



Two views of the Bucyrus-Erie convertible shovel n action

Synthetic Petroleum in Japan

(Bulletin of The South Sea Association)

JAPAN is generally regarded to be poor in petroleum resources. It is true that the bulk of its annual consumption of oil has to be imported. However, the country is not really deficient in natural resources of petroleum. They are presumed to be abundant. The fact is many of them yet remain uninvestigated. According to figures of the Cabinet Planning Board, oil-bearing strata in the whole country reach 5,000,000,000 *tsubo* (1 *tsubo* equals 35.584 square feet); they are said to cover 10,000,000,000 *tsubo* by petroleum experts; the American Geological Survey Bureau puts the percentage of petroleum resources in Japan at 18, against 16 for the European continent.

In the light of such data, one cannot jump to the conclusion that Japan lacks petroleum reserves. The actual situation is that, due to insufficient geological survey and prospecting, many petroleum resources have been left untapped. But the pressing need of developing them has long been felt, and various measures for exploiting them are now under consideration.

Strenuous efforts are also being made to increase the output of existing oil-fields by adopting efficient methods of production. In the meantime, with the aim of securing self-sufficiency in natural petroleum, a five-year plan, extending over the fiscal years 1938-1942, has been formulated. Under this plan, prospecting is to be carried out for 330 wells in the oil-bearing regions of the country with an appropriation of Y18,000,000 for subsidizing the work.

These measures, of course, are not considered sufficient immediately to secure production of the required quantities of petroleum. Accordingly, in parallel with the plan to increase the yield of natural oil, scientific studies are being pushed in the synthetic petroleum industry with a view to covering the shortage of natural petroleum. Thanks to untiring endeavors in this field for well over ten years, artificial methods of liquefying coal have now been perfected, and this success led the Government in 1937 to establish the Imperial Fuel Industry Company (Teikoku Nenryo-Kogyo Kabushiki Kaisha) with a capital of Y100,000,000. This company is a semi-official concern and is vested with supreme leadership of the synthetic petroleum industry. Subsequently, many subsidiary companies have been established and the synthetic petroleum factories constructed by them have commenced operation with satisfactory results.

At present, it may be said synthetic petroleum manufacture has been fairly well developed, fully industrialized, and turned to practical account; its technique, machinery and equipment are in perfect trim, leaving nothing to be desired. However, as a commercial proposition, the new industry is not yet near a paying basis.

In order to understand the real situation underlying the synthetic petroleum industry in Japan, it is necessary to examine such problems as invested capital, coal (as the raw material), building materials (for factory construction), manufacturing technique and petroleum engineers, etc. There are two questions which are asked by those sceptical of synthetic petroleum: one, the feasibility of manufacturing synthetic petroleum after all and, the other, if so, whether the new industry can be operated on a paying basis.

The first point of technique can be understood by studying methods of synthetic petroleum. The methods employed at present are: (1) low-temperature carbonization of coal, (2) hydrogenation, (3) synthetization. According to the first method, coal is put into a furnace and heated up to 500° C. or so, whereby the substance of tar is separated by means of dry distillation. This method came into use a good many years ago and it is now widely employed with increasingly satisfactory results, for instance, at the collieries of Eian in Chosen, Uchihoro in Karafuto, Wanishi in the Hokkaido and Ube in Yamaguchi Prefecture.

The second method, hydrogenation, is commonly called direct liquefaction of coal. Chemical analysis of the components of coal and petroleum shows that hydrogen is deficient in coal and that, if this deficiency is made good, coal can be turned into petroleum. The hydrogenation process of liquefaction requires such high temperatures and air-pressure as 400° C. and 200, respectively, which are unparalleled in industry. New plants at Agochi, in Chosen, and Fushun, in Manchoukuo, to be operated by this method were completed last year through the ingenuity of the Japanese engineers.

The production of benzine by hydrogenating tar obtained through the low-temperature carbonization process also has attained a remarkable development, and in the city of Szupingchieh, Manchoukuo, a plant aiming to industrialize this process has been constructed. Similar plants are now under construction in the cities of Kawasaki, Nagoya and Wakamatsu respectively by the Nihon Yuka Kogyo Company, the Tobo Kagaku Kogyo Company and the Nissan Yekitai Nenryo Company. Besides them several other projects along the same line are under contemplation.

The third method consists of converting coal at first into a gaseous substance and then producing petroleum from it through another synthetic process. Due to scientific study conducted for many years, this method particularly has proved successful in Japan. The process is known in Germany as the Fischer method as it was brought to perfection by Dr. Fischer and transferred to a German corporation for industrialization. As it was considered profitable to adopt this method in Japan for rapidly developing the industry, the Mitsui Bussan Kaisha acquired its license and two factories are now being constructed by this company, one at Miike, in Kyushu, and the other at Kinken, in Manchoukuo. The Hokkaido Synthetic Petroleum Manufacturing Company, which was established late last year, will construct two factories, at Ryusen and Tomae in the Hokkaido, for the production of 100,000 kgs. of artificial petroleum a year.

Of the three methods described above, the low-temperature carbonization process, which is now an established one, has amply proved its superior efficiency. The hydrogenation and synthetic methods are still open to question, calling for further study. Because of the fact that already constructed plants, which are to be operated by these two methods, have been delayed in starting work to a much greater extent than previously planned, the public are inclined to entertain doubt about the technique of synthetic petroleum production, or about the possibility of manufacturing synthetic petroleum. It may, therefore, prove worthwhile to survey this problem.

The hydrogenation system has reached its present stage of development through collaborated technical experiments since 1921 by Japanese navy experts, the Chosen Nitrogenous Manufacturing Company and the South Manchuria Railway Company. These companies have each established a factory at Agochi, Chosen, and Fushun, Manchoukuo. The former is under joint management of the Imperial Navy and the Chosen Nitrogenous Manufacturing Company, while the latter is jointly operated by navy and the South Manchuria Railway Company.

It may be of interest to cite, as an instance, how the factory at Agochi operates In order to obtain hydrogen for the hydrogenation of crude coal, air is liquefied and dissolved into nitrogen and hydrogen, exactly in the chemical separation of air in the ammonium sulphate fertilizer industry. The process of obtaining hydrogen is done by infusing oxygen and vapour into coal. Liquefying air is not uncommon, being generally employed in the fertilizer and other similar industries. The entire equipment for this process hitherto used to be imported. Since the importance of the equipment already has been recognized by the chemical industries of Japan, studies were carried on in various quarters concerning their manufacture and when the Agochi factory was established, equipment of Japanese make was installed. But it was subsequently found that it contained certain constructional defects, requiring readjustments. This work has not been completed. As far as the fundamental principle of hydrogenating coal is concerned, there was never any serious question, or trouble.

Now, having gained full confidence in technical matters concerning the new industry, the Chosen Nitrogenous Company has decided to expand its plant at Agochi on a large scale. The company also is planning to erect another large plant in Manchoukuo, with a capital of nearly one hundred million yen, aiming to produce several thousand millions of kilogrammes of artificial oil per year. This new plan, not only demonstrated the company's confidence in its manufacturing technique, but should dispel all apprehension entertained in the past about the technique of hydrogenation.

The Fushun factory under management of the South Manchuria Railway Company has been functioning favorably and now it has entered upon the stage of serious operation. The fact that the hydrogenation enterprise has achieved such splendid success is nothing but crystallization of the laborious efforts of those directly concerned with the project for more than a dozen years past. This achievement, it must be said without exaggeration, is a new record in the industrial history of Japan.

Germany has taken the initiative in placing this method on an industrial basis without delay, while Japan was apparently lagging behind the Western countries in this respect. Meanwhile turning their attention to the promising future of the synthetic method, the Mitsui Mining Company purchased the patent right of the Fischer system. This unique device is certain largely to contribute towards the development of the synthetic petroleum manufacturing industry. However, it is expected that still some years' research will be required before the technique can be converted into an original Japanese system. With this goal in mind, Mr. Ban, president of the Kyoto Imperial University and Dr. Inouye of the Tokyo Industrial Experimental Station have been carrying on assiduous researches on the subject for several years.

If and when these individual studies—which already have been rewarded with excellent results—are successfully combined with the Fischer method, the development of a Japanese technique of synthetic petroleum manufacture can be attained without difficulty. As may be gathered from the above explanation that what is generally termed the synthetic manufacture of petroleum is a rather complex process. It involves three essential issues: first, the production method; second, manufacturing technique of equipment and the machinery required for factory construction: and, third, the engineering ability necessary for the manufacture of equipment and machinery. In the light of the advanced industrial condition of Japan, it may be said that the first two questions already have been solved. The fact that the Agochi factory was constructed entirely with home-made materials serves as clear proof. What is to be regretted, however, is that the matter of engineering skill leaves much to be desired. It follows then that the replenishment of engineering capacity is an urgent need for development of synthetic petroleum manufacturing in this country. It can be said that if an abundant supply of materials and engineering ability is made available, any number of synthetic petroleum factories could be established with success. In fact, it may be said conclusively that the questions of technique, manufacturing methods and of engineering art in the manufacture of necessary equipment now have been satisfactorily settled.

The above remarks indicate that the industrializing of synthetic manufacture of petroleum now has become feasible. It has, of course, to be understood that it will be sometime before commercialization of the new industry may be realized paralleling that of the natural petroleum industry. In order to achieve this objective, domestic technique must be swiftly developed through harmonious collaboration and co-operation among all the quarters concerned.

In regard to manufacturing methods too, in addition to the above-mentioned three processes, some other efficient devices will have to be discovered, or another process of administering hydrogenation by dissolving coal with the application of a solvent (which is now in the experimental stage) must be worked out. Although the synthetic petroleum industry has been established upon an industrial basis, this does not mean that a complete solution of technical questions has been found; on the contrary, it must be said that the prosecution of further study and experiments has come to assume much greater importance.

The second frequent question is whether the synthetic petroleum industry really can be placed upon a paying basis. Without doubt, in comparison with natural petroleum imported from America, the new industry as a commercial enterprise is yet in its infancy, and probably will remain in that state for some time to come. This situation is clarified by the following data on imported natural benzine and synthetic benzine.

Imported benzine, c.i.f., costs approximately 30 sen per U.S. gallon. With 17.5 sen in customs duty and five sen in consumption tax added to this, the market price at sales stands in Japanese cities at present is 64 sen.

Under the laws in force, provision is made for protecting synthetic petroleum by granting a bounty for its production. And the standard scale of such bounties is to be notified each year by the Ministry of Commerce and Industry, which determines it on the basis of the actual cost of production, as well as the allowance of an adequate margin of profit. Last year, the bounty was notified only for products by low-temperature carbonization, but, beginning with the current year, it has been arranged to extend the benefits to producers employing the hydrogenation and synthetic methods. The rates of such bounties for the present year have not been fixed.

Supposing, however, that the bounty per kilo-litre is fixed at 60 yen, payment per U.S. gallon would amount to 23 sen or so. And, if subsidized synthetic petroleum, and the imported benzine as well, could be sold at the same market price, the price per gallon of non-subsidized synthetic petroleum, would amount to 87 sen, which corresponds to the total 64 sen and 23 sen stated above. On the other hand, if imported benzine could be sold without imposition of taxes, its market price per gallon would be 41.5 sen, namely, the balance between 64 sen and 22.5 sen. On this calculation, the price of synthetic petroleum is roughly double that of the imported benzine. In short, the protection given a gallon of synthetic petroleum at present is 45.5 sen, which equals the sum of duty and bounty put together.

However, judging from the present all-round increase in costs of providing materials and plants, such bounties as those mentioned above are hardly enough to keep factories operating. Thus in the future the Government subsidies may have to be considerably increased, in which case the cost of producing synthetic petroleum would be kept correspondingly low. But the idea of comparing synthetic petroleum with imported American oil from the commercial point of view has little significance, at least under the existing war time economic structure of Japan. The question of commercial value must be considered from two angles: first, the necessity of realizing self-sufficiency in liquid fuel in relation to national defence and industrial considerations; and, second, the necessity of checking payments to foreign countries, which amount to several hundred million yen a year.

For example, in Germany it is possible to obtain imported benzine at less than 30 sen c.i.f. per gallon, as in the case of Japan, and to sell it at the market price of 40 sen or so. But the imported benzine is taxed so heavily that its market price per gallon is always maintained at the level of more than two yen. This is chiefly because of Government measures taken for protection of the synthetic petroleum industry in Germany.

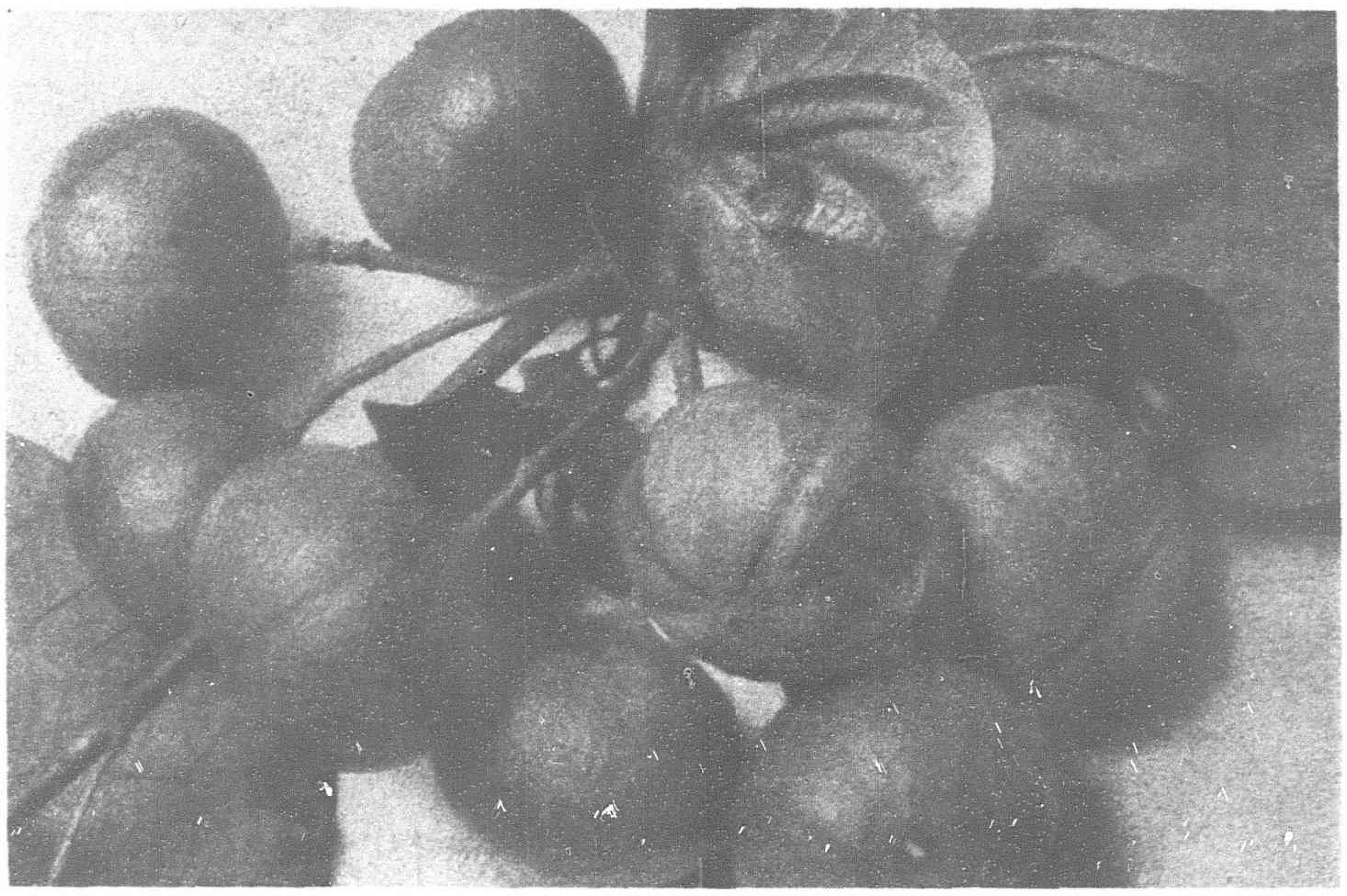
Likewise in Japan, if the Government is intent upon materializing a self-supply of liquid fuel, even though considerable bounties will have to be paid the new industry, or a high-market-price policy may have to be adopted as an alternative, the essential value of synthetic petroleum must not be called into question from the mere consideration of its commercial account. This state of affairs may be clearly inferred from instances in foreign countries.

In Great Britain, it has become a matter of general acceptance among the people that the production of every ton of synthetic petroleum inflicts a burden of ten pounds upon the State. The market-price of imported petroleum in this country is on the same level as those of Great Britain and Germany, while the cost of coal and labor is much cheaper. Therefore, compared with them, Japan is in a highly favorable position in regard to the production of synthetic petroleum.

The above observation has been made with particular reference to the matter of commercial account at present and in the immediate future. In the meantime, there is growing confidence in technical potentialities that the industry under review eventually will be able to acquire a paying basis in comparison with natural petroleum. If, therefore, this new industry should in the future gradually become so expanded in scale as to enable it to be operated economically and if the commercial account of the industry should be increased in proportion to factory expansion and technical advancement, then the time will certainly come when the much-talked-of question of its commercial account will pass into a solid fact.

Frost in U.S. and China's War Hits Tung Oil Market

(Far Eastern Survey)



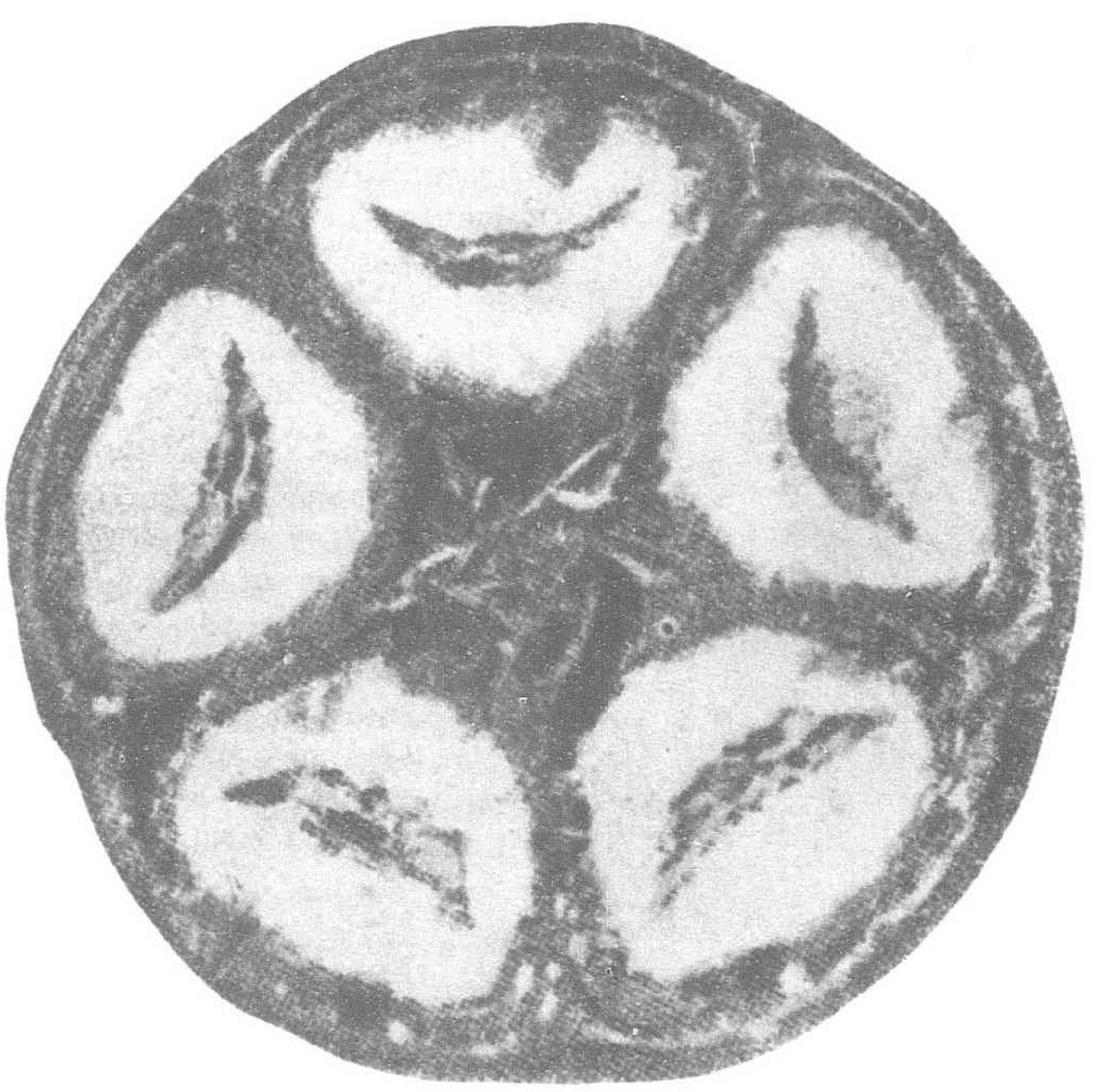
A cluster type of tung nuts showing heavy fruiting character on terminals

News of the destruction of around three quarters of the 1939 American tung crop by frost underscores the urgent problem facing paint and varnish manufacturers to-day as to the probable future sources of supply of a commodity practically indispensable to their industry. Tung oil has been, until the present Sino-Japanese hostilities, an almost undisputed monopoly of China; virtually 99 per cent of American tung imports (valued at $20,061,720) came from China in 1937, and about the same (valued at $11,923,388) in 1938 despite increasing difficulties in shipping from Chinese ports. These difficulties, however, have been clearly reflected in the market price of the commodity, which normally averages ten cents to 14 cents per pound but which sky-rocketed to the prohibitive figure of 22 cents when Shanghai was occupied in 1937 and has hovered between 12 cents and 15 cents since the fall of Canton has made shipments from South China undependable. In the general stocktaking now going on, certain questions are being raised with greater and greater frequency: Can the United States depend on a continuing supply of wood oil from China? How long will it be before domestic tung cultivation in the United States will yield a significant supply of tung oil? How far has substitution for tung oil been carried, and how satisfactory are the substitutes which have been developed?

The cultivation of tung trees in China, the expressing and refining of the oil, and the transhipment of tung oil to the coastal ports from the interior provinces where it is produced have, until recent years, been carried on under the most primitive and inefficient conditions. It is estimated that about one-third of the available oil in the tung seeds (valued at some Ch.$30,000,000) was wasted each year because of the inefficiency of the crude hand presses and the lack of scientific knowledge on the part of the farmers concerning the proper care of the trees. Unevenness of color and quality of the oil inevitably resulted. Moreover there existed a widespread practice of adulterating tung oil with resin, mineral oils, and so on, by the many intermediaries through whose hands the oil passed prior to export abroad. Finally, facilities for transporting the oil to Yangtze River ports from Szechuen and the other producing provinces were extremely costly and inadequate, a factor which probably had most to do with stimulating dissatisfied consumers abroad to initiate cultivation of the tree in their own countries.

In the last three years the Government Testing Bureau and the China Vegetable Oil Corporation have made great strides in regulating the quality and promoting standardization of China's tung oil. The National Government, recognizing the economic importance of tung oil as one of the country's leading exports, set about systematically to stabilize and develop the industry. Up-to-date hydraulic presses, refining plants and storage tanks were installed in various centers of manufacture, a modern research laboratory was set up, and government financial assistance was proffered in the interest of minimizing price fluctuations. Adequate transportation facilities, however, still remained the most acute problem to be solved, and with the advent of the present hostilities this problem was doubly intensified. The cutting off of Shanghai, normally the chief tung-oil outlet, was a blow to the industry; the blockade of the South China coast was a calamity. China's retention of the tung market now depends on the possibility of maintaining a dependable flow of the oil through Hongkong or, as a last resort, through French Indo-China and Burma. The advances in the price of tung oil this spring, however, which followed upon reports of Japanese military movements near interior transhipment centers like Changsha and naval activities in the Hongkong area, indicate that local consumers are not optimistic in regard to the potentialities of western Chinese outlets.

There are three factors which are maintaining high interest in the Chinese tung-oil market among importers and manufacturers in the United States in spite of irregularities in production and uncertainties and costliness of transportation. The first has already been mentioned, namely, the serious difficulties that have been encountered in domestic tung cultivation. In six southern states the cultivation of tung trees has been actively promoted since 1923 when tung prices soared. The American Tung Oil Corporation was organized at that time, with a capital of $100,000, to demonstrate the possibilities of tung-oil trees as a commercial crop in the United States. By the end of 1934, 40,000 acres were planted in the south, with an estimated stand of 40,000,000 trees. Tung-oil experiment stations were established in three states by the Department of Agriculture. By the end of April 1939, eight extracting plants were operating, equipped with presses able to do the work of 100 Chinese workmen.



Cross section of a tung nut

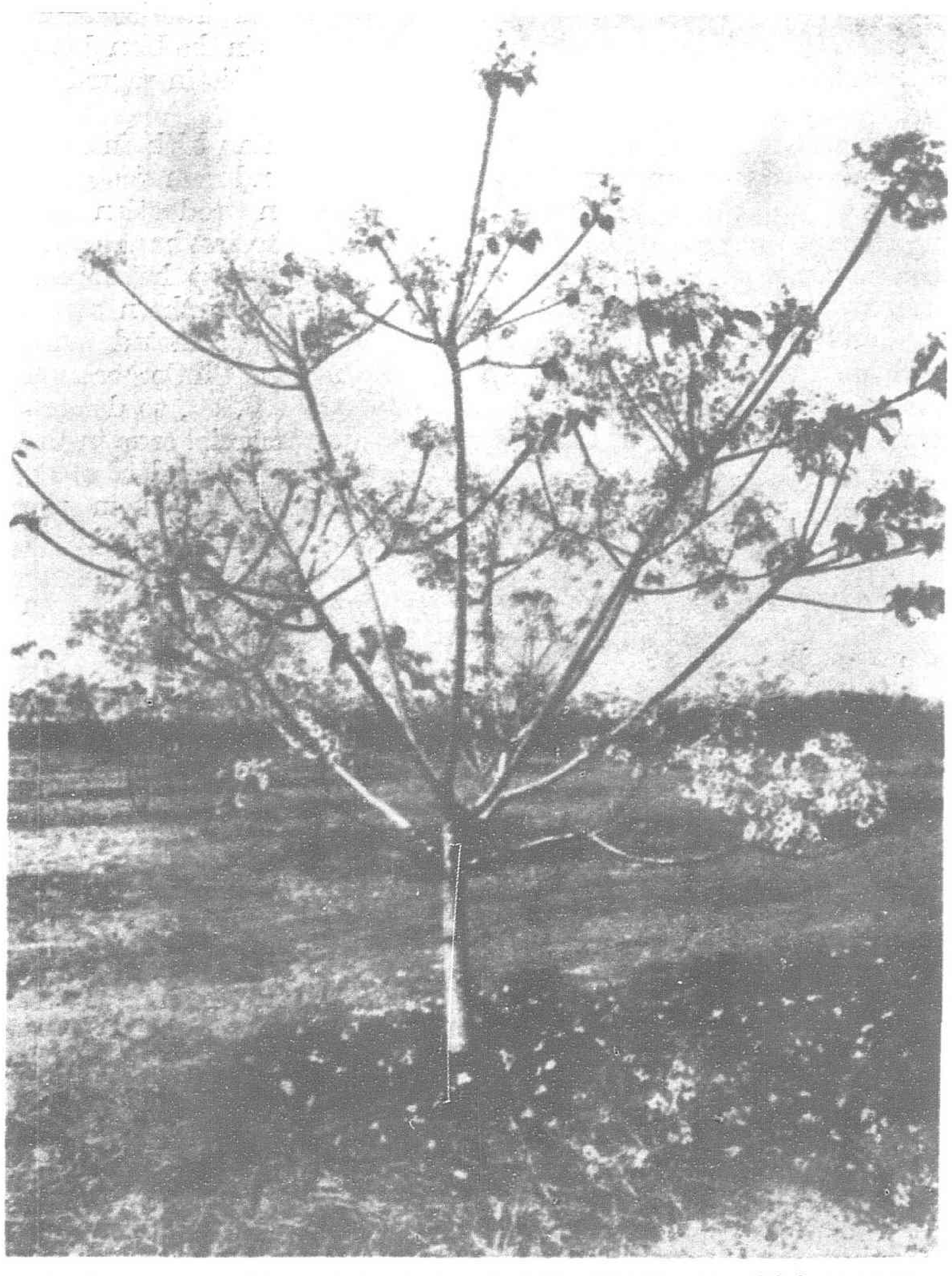
The efficient agricultural techniques, the standardized quality of the product, the 80 per cent reduction in transportation costs as compared to China—all swelled the hopes of agriculturalists and manufacturers alike for this promising new industry. A 5¼ million lb. crop had been predicted for this year. But the recent devastation of southern tung plantations by frost has rudely awakened plantation owners to the realization that American competition with the Chinese market is still far distant. Even in 1938, with Chinese imports greatly reduced,

A fine example of bearing tung tree

the United States produced but four per cent of the tung oil which she consumed. "Conservative opinion is that domestic tung production will become increasingly important, but not a decisive price factor until 1942," says H. D. Lytton in the *American Paint Journal*, referring to the large plantings which would mature during the next three years. Even should the most optimistic expectations of domestic producers be realized, it would seem that a substantial balance of America's tung-oil requirements will have to be provided by China.

Great Britain has also been undertaking intensive experiments in tung cultivation in various parts of its colonial territory. Africa, New Zealand, Australia, the West Indies, India and Burma are among the many areas that have witnessed active experimentation, with Australia and New Zealand yielding some of the most successful results to date. It is estimated that some 700 growers were cultivating about 224,000 trees in Australia in 1938. But, as in the case of the United States, the actual yield of oil in these areas is still so small and so undependable that no serious rivalry with the Chinese market is probable for some time to come.

The second factor which has sustained demand for Chinese tung oil at a high level has been the widespread revival in the residential building industries in the United States, as indicated by the heavy contracting during the first two months of 1939, and also the revival in the automobile industry since the recession. The result has been an upswing in business for the paint and varnish industry considerably in excess of the customary seasonal rise, and tung consumers have been willing to buy at higher prices than in previous years (Tung oil constitutes 27 per cent by weight of most typical varnishes). Moreover an evergrowing number of uses for tung oil in other industries is still further enhancing its value to American manufacturers. About 7.2 million lb. are used annually in the manufacture of linoleum, oilcloth and other fabrics requiring coating or waterproofing, 2.8 million lb. in the manufacture of printing inks, and 4.8 million lb. in a variety of miscellaneous products including textiles, tin plating and artificial leather. It is becoming increasingly essential in the electrical industry, where it is used in the manufacture of certain insulating compounds for cables and wire coatings. A recent development which may prove of importance is the use of tung in the manufacture of plastics.



A three-year-old tung tree showing the blossoms which appear in early spring, preceding the leaves. The blossoms are white, tinged with pink

The continuing demand for tung oil from China is due finally, and not least of all, to the lack of success in developing adequate substitutes. When the price of tung rises above 12 cents a pound, paint manufacturers tend to favor substitution of other drying oils. With tung prices almost continuously above this level and deliveries from China so uncertain during the past two years, there have been extensive attempts at substitutions of linseed oil, Manchurian perilla oil, oiticica oil from Brazil, synthetic dehydrated castor oil and other near substitutes. Convincing evidence, however, that the tung-oil market is still not seriously threatened by the inroads of substitutes has just been offered in the report on consumption of fats and oils issued by the Bureau of the Census. The report indicates a 25 per cent increase in the consumption of tung oil for the first quarter of 1939 over the figure for the same period last year, as compared with gains of only 21 per cent and 13 per cent in the consumption of linseed oil and perilla oil respectively.

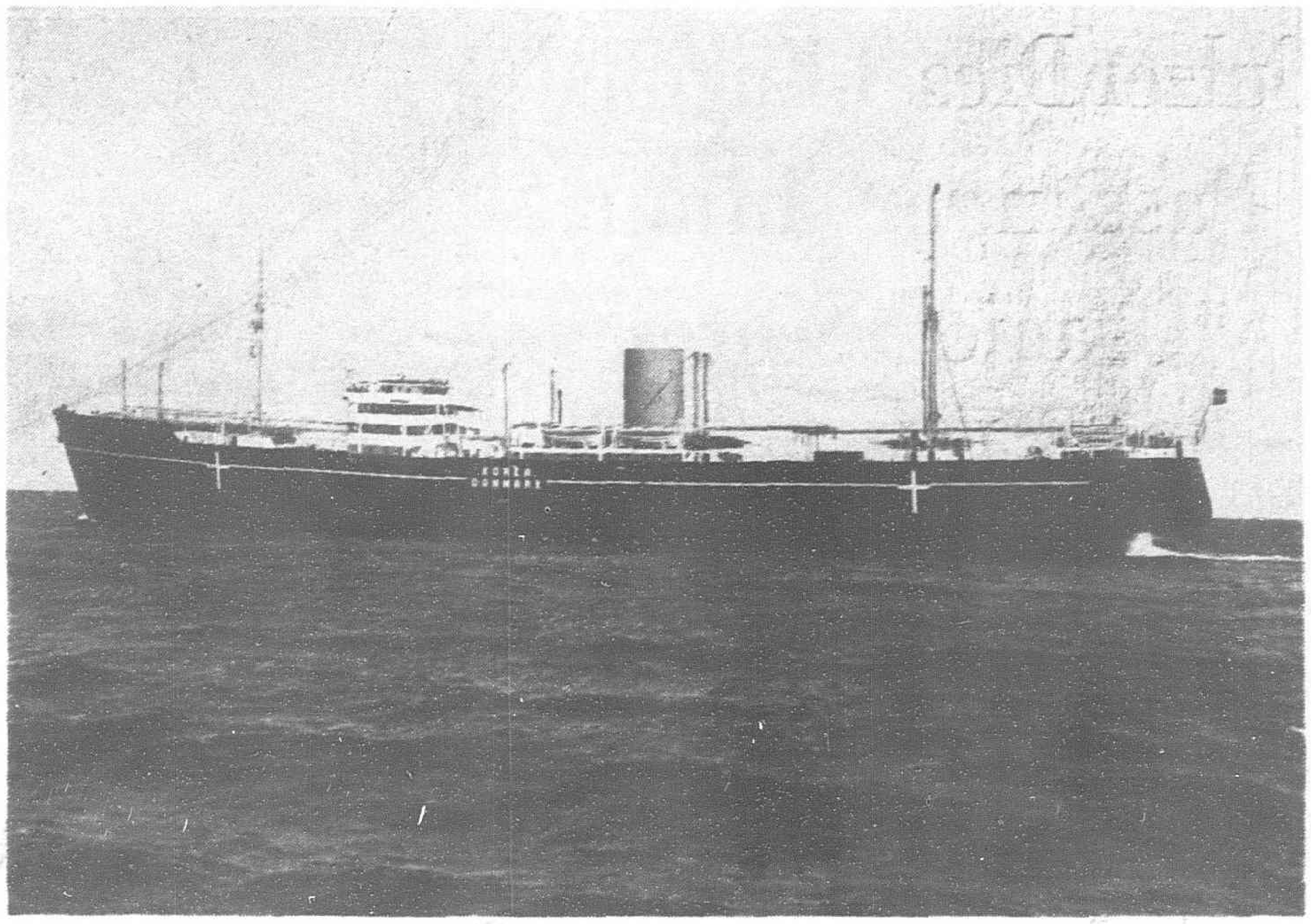
It would seem clear that as long as tung oil can be secured from China it will continue to find a ready market in the United States, even at a relatively high price level. The seriousness of the threatened shortage—particularly now that reserve stocks are so low—was officially recognized last December when the $25 million credit to Chinese interests was authorized by the Export-Import Bank of Washington; among the announced purposes of the loan was the facilitation of tung-oil shipments to the United States.

With an annual output of more than 500,000 piculs in normal times Szechuen province leads in the production of tung oil in China followed in order by Hunan, Chekiang, Kwangsi, Kweichow, Shensi, Fukien, Anhwei and Kiangsi. The tung tree in China grows best between longitude 120 degrees east and latitude 23 degrees and 33 degrees north.

Cargo Motorship from Nakskov Yards Goes Into Service

On September 27 last, the cargo motorship *Korea* built by the Nakskov Shipyard left the yard for Copenhagen, where the ship arrived after having carried out speed trials on the Hveen mile.

The ship—which is a sister of the m.s. *Kina*—has been built to The East Asiatic Company Limited of Copenhagen in accordance with the special requirements for vessels serving this company's regular China-Japan route, and it means in many respects considerable progress from the ships previously built for this route. Special care has been taken to arrange the ship as practical and comfortable as possible for the passengers. The cabins and messrooms of the crew are all very roomy and light.



New motorship "Korea" as seen on trial runs

The ship has been built to British Lloyd's highest class+100 A.I., and has the following principal dimensions :

Length	506-ft. 10-in.
Breadth	65-ft. 0-in.
Depth to upper deck	41-ft. 9-in.
Carrying capacity	about 12,300 tons,
Contracted speed	16.0 knots.

The main machinery, which consists of one eight cylinder B. & W. two stroke cycle Diesel motor, develops normally 11,000 i.h.p. The auxiliary machinery includes three five cylinder four stroke cycle Diesel motors, supplied by Burmeister and Wain.

The ship has two complete steel decks and further tweendeck in Nos. 1, 2 and 3 cargo holds. The vessel is provided with a modern cartonic acid fire extinguishing plant with a pipe-system which automatically shows any formation of smoke—be it ever so slight—in every room in the ship.

There are six large hatches for the cargo holds, the size of which is 712,900 c.ft. bales. They are served by 16 derricks with electric winches of Thomas B. Thrige's manufacture. The lifting capacity of the derricks varies from three to ten tons. Further, the ship is furnished with heavy derricks for 20 and 40 tons.

The steering gear is of Thomas B. Thrige's all electric type. The windlass is likewise electrically driven and has been supplied by Thomas B. Thrige, Odense, Denmark.

The passenger accommodation consists of four two berth cabins and four single berth cabins, which are very large and airy and equipped with chromium-plated bedsteads with rubber mattresses. The cabins have their own bathroom, W.C., and washbasin with hot and cold water.

Forward in the saloon house, a dining-saloon accommodating 20 persons is situated. The saloon has been carried out with bulkheads and furniture of light mahogany. From the dining-saloon a broad stairway leads to the passenger cabins and the smoking saloon on the promenade deck. The smoking saloon has likewise polished mahogany panelling. Everywhere in the cabins and saloons noise-reducing rubber flooring, supplied by Bridana Ltd., of Copenhagen, has been used.

The ship is furnished with oil-fired range and baking oven, and very spacious cooling chambers with refrigerating machines for provisions, etc., are provided (The refrigerating machinery has been supplied by Atlas Ltd., Copenhagen). An electric refrigerator of Thomas Ths. Sabroe & Co.'s manufacture is fitted in the scullery.

The life-saving appliances are of the most modern kind, and the life-boats are placed under *Schat* davits of latest type. The ship is fitted with a powerful radio station and radio direction finder, which have been supplied by Dansk radio A/S., Copenhagen. The construction of the ship was commenced in November, 1938, and the launching took place on July 18, 1939, as set forth in the September issue of *The Far Eastern Review*.

After the trial-trip in the sound, the ship was taken over by the owners.

Beware the Ides of February

(Continued from page 442)

States Senate to explore fully and weigh every remote possibility that may develop from adoption of the resolution, remembering that even President Roosevelt is human and therefore fallible. If Japan is forced into unholy union with Soviet Russia, and Russia and Japan then move along lines they took together about thirty years ago in Manchuria and decide to partition China, what then of the tenets of the American Far Eastern policy—the Open Door and the integrity of China ? Great Britain and France are quite preoccupied in Europe and these powers may not be expected to resist in the Far East effectively. Will the United States follow through the gesture it already has made and take the only logical step that can be effective ? Or will it be possible for the United States to refrain from taking that step ? The United States cannot gain any desirable advantage in East Asia, but undoubtedly it possesses the power and the resources to order and control events in this far distant Pacific sphere. Any belief, however, that such a responsibility may be assumed and carried out by " measures short of war " is a miscalculation.

If some kind of an institution like the anti-God groups of Russia might be spewed out of the nether regions to reverse such aims as those of the Nobel institution in making annual awards, it might begin by giving recognition to the world's most sinister diplomatic force. For any award of this kind Comrade Josef Stalin stands alone unrivalled, for behold ! For more than two years China and Japan have been locked in conflict for the future greater glory of Stalin, who is Russia. Latterly all Europe has been plunged into bloodshed for Comrade Stalin's greater power. If now Japan will espouse Comrade Stalin's Russia and so be snared into position where she may the more easily be thrust into war with the United States, the angels must weep, for Comrade Stalin then can stand and look out upon a whole world aflame and thus attain, in this lesser sphere, equality with the Devil himself.—*val.*

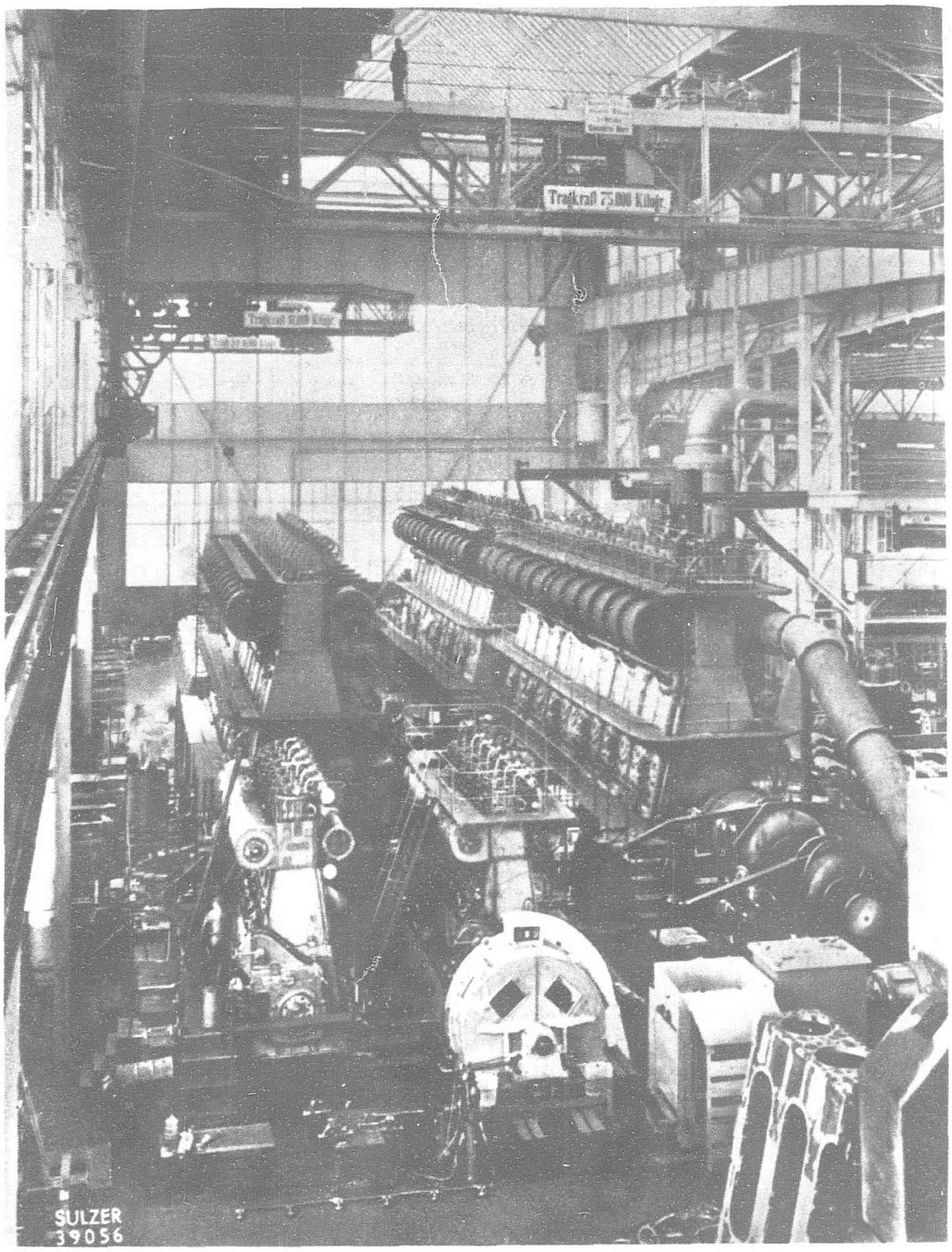
Sulzer Diesel-Engined Passenger Liner "Oranje" Scores Speed Record

Power Plant of Craft for East Indies Service is Largest of Kind Ever Put Into a Passenger Vessel

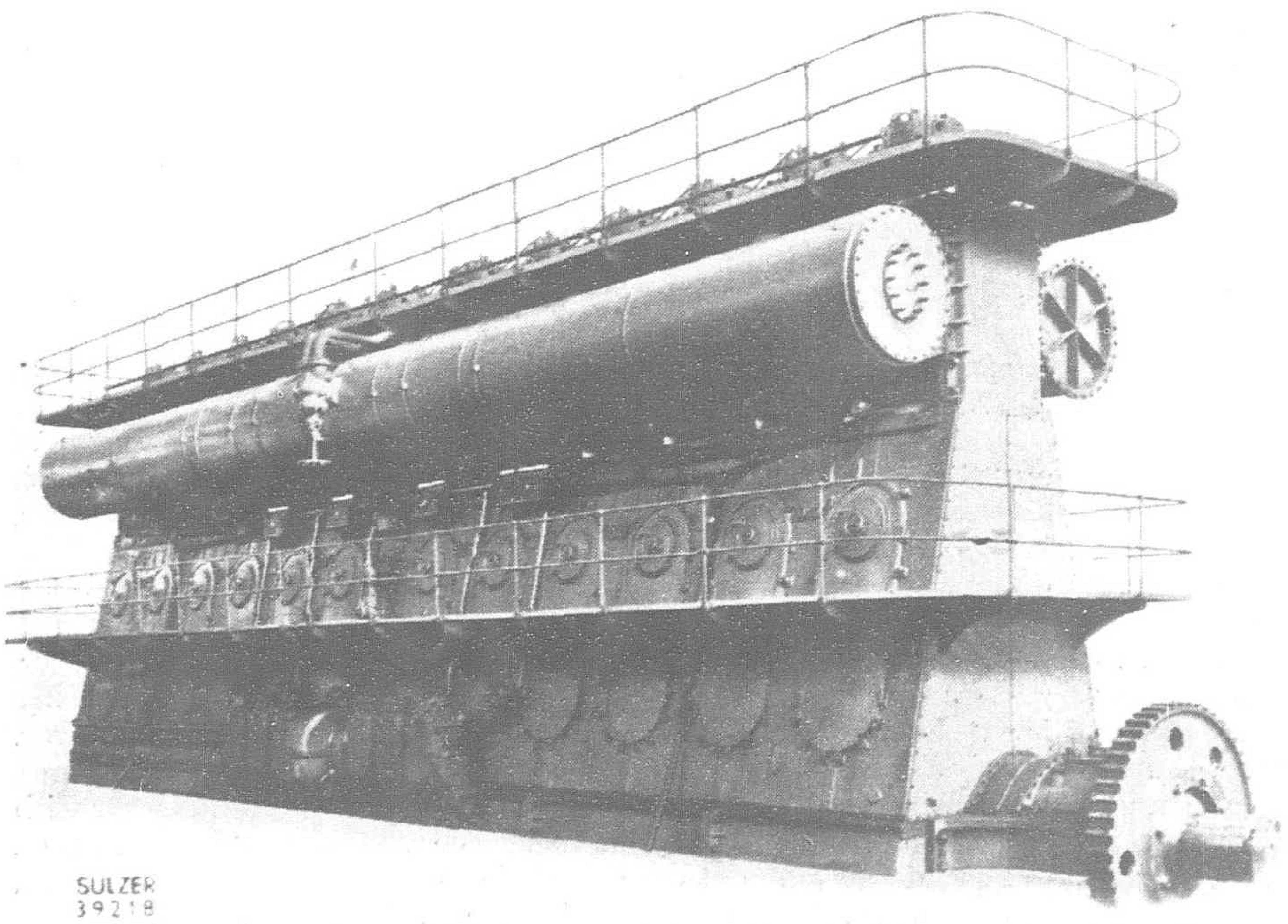
The official trials of the Dutch motor passenger liner *Oranje* took place from June 27 to 29, with about 500 guests from Holland and other countries. The tests were not confined to the propelling machinery, but were also extended over all technical equipment (ventilation, wireless, water-tight bulkheads, emergency lighting, "blacking-out," gyrocompass, echo sounding device, etc.), and proved to be highly successful not only for the builders of the vessel, but also for the makers of the propelling machinery.

The *Oranje* was run 20 times over the measured mile off St. Abb's Head, south of the Firth of Forth, and reached a mean maximum speed of 26.3 knots. The vessel has therefore broken all records for motor passenger liners. The contract service speed was stipulated as 21 knots. The result obtained has consequently exceeded all expectations.

After the trials the engine room was made free for visitors. The expression "engine room" gives little idea of the size of the machinery installed in this vessel, since the main and auxiliary Diesel engine plant, with its total of 46,500 horse-power represents the largest Diesel engine plant that has ever been installed in a passenger vessel.



Showing the three 12,500 b.h.p. Sulzer two-cycle Diesel engines for the Dutch motor passenger liner "Oranje" in the erecting shops at Winterthur. In the foreground are two of the five 1,800-b.h.p. auxiliary Diesel engines



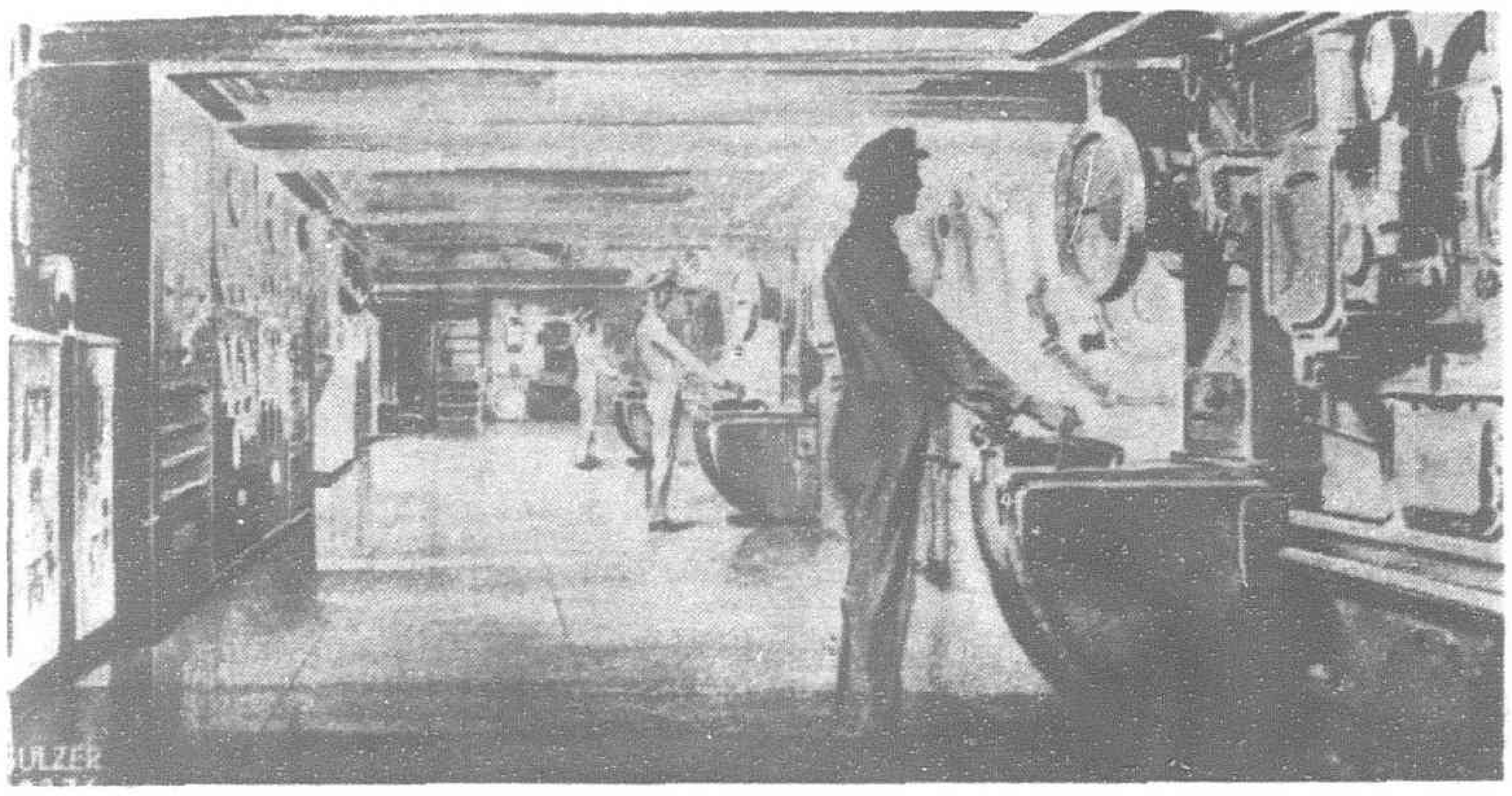
Close-up of one of the 12,500 b.h.p. Sulzer Diesel engines on the "Oranje"

The *Oranje* is intended for service to the Dutch East Indies and will reduce the duration of the voyage from Genoa to Batavia by four days.

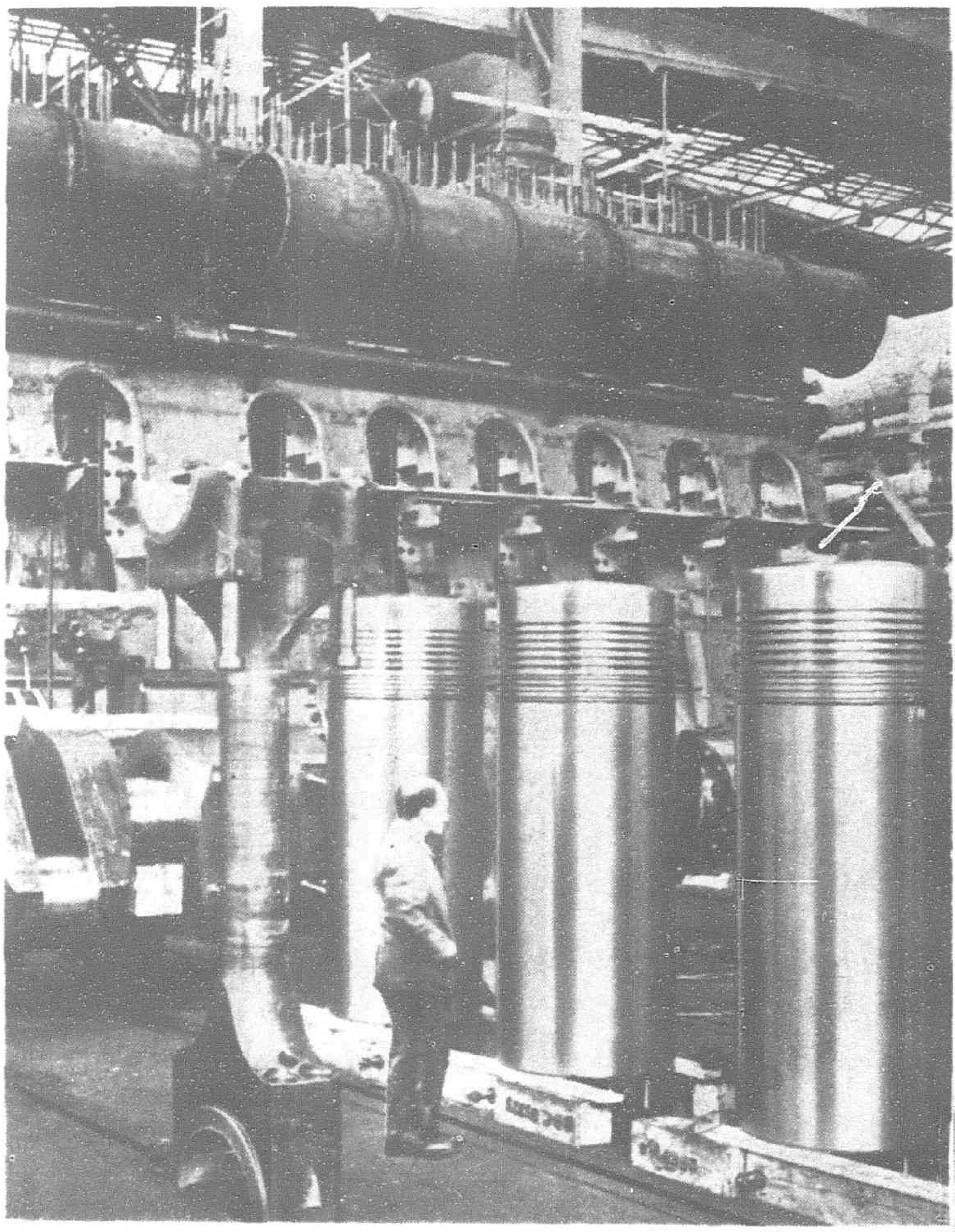
The propelling engines are of the Sulzer single-acting two-cycle type with cylinders of 760 mm. bore and 1,250 mm. stroke; each engine develops 12,500 b.h.p. at 145 r.p.m. The engines are controlled by means of three handlevers—a starting lever for setting the engine in motion—a fuel lever that can be adjusted between no-load and maximum load, and—a telegraph lever with which the engineer in charge confirms the orders received from the bridge and sets the controls of the engines. Various indicating devices let the engineer know whether the control operations directed by him have been properly carried out.

In addition to the three main engines there are also five Sulzer two-cycle auxiliary engines each of 1,800 b.h.p.; they drive electric generators, the energy of which is used for working the scavenging air blowers of the main engines and also for various auxiliary services.

It is noteworthy that two of the main engines were installed in the vessel without undergoing any preliminary trials. Only the middle main



Manœuvring platforms of the three 12,500 b.h.p. Sulzer Diesel engines of the motor passenger liner "Oranje"



Crankshaft, connecting rod and three pistons of the 12,500-b.h.p. Sulzer Diesel engines of the Dutch passenger liner "Oranje"

engine and the five auxiliary engines were tested at Winterthur. At the official trials the fuel consumption of the main engines amounted to 151.5 grams/b.h.p.—hour.

A Sulzer refrigerating plant is provided for cooling the rooms; by means of it, when outside temperatures are at the maximum, the interior of the ship can be kept as cool as desired. By operating a simple handlever, a passenger can allow as much cooled air to enter his cabin as he wishes. The rooms are heated partly by warmed air and partly by electric heaters. A large number of Sulzer pumps and fans have been installed for handling water and for the various ventilating installations.

The *Oranje* will leave on September 6 for her maiden voyage to the Dutch East Indies.

A Great General: The Malaria Mosquito

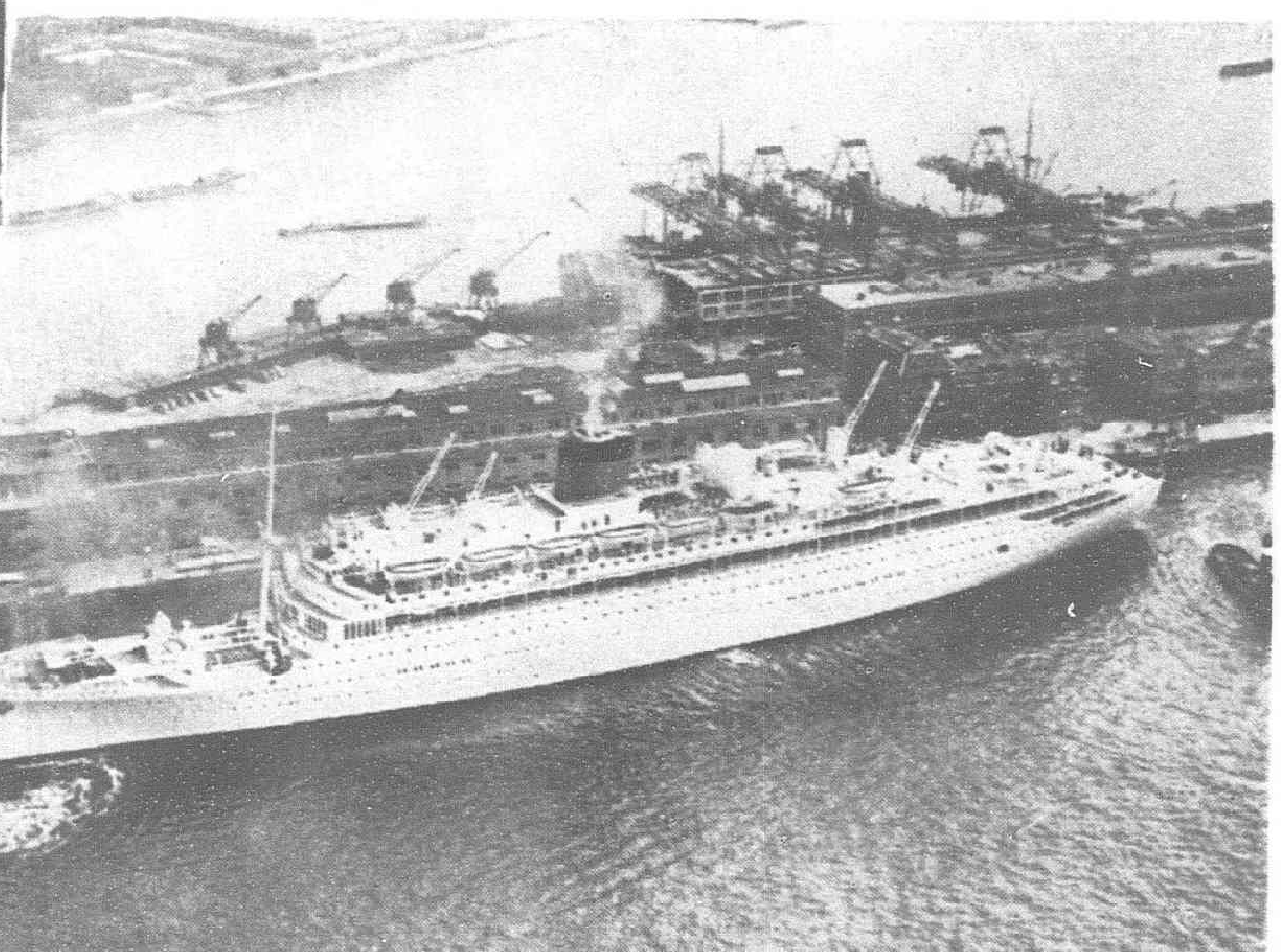
About 700 B.C., Sennacherib, King of Assyria, conducted a campaign against Jerusalem. He was at the head of a powerful army and at that time it must have been no light matter to maintain and keep in good health such a large body of troops without the medical supplies that are now at the disposal of a modern army. In Sennacherib's time and for a considerable period afterwards, there was no protection against malaria mosquitoes; and yet, on the South-American continent, still unknown at that epoch, there existed the cinchona, from which, many centuries later, was to be extracted the natural remedy known as Quinine for the greater well-being of humanity.

Sennacherib's army traversed the valley of the Jordan and then advanced into the mountains of Judea, to lay siege to Jerusalem. We know from historical tradition, that the "Angel of the Lord" caused the death in a single night of more than a hundred thousand Assyrian warriors.

What had happened? Sennacherib was unable to reply to this question, but we now know the reason of his defeat: it was due to the malaria mosquito of the Jordan valley. As a matter of fact, this valley lies about 300 meters below sea level; it is hot there even during winter and the malaria mosquito finds an ideal breeding place there. Jerusalem, on the other hand, is about 800 meters above sea level and its climate is relatively cool even in the summer. The Assyrian warriors were attacked by malaria in the valley of the Jordan and when the cold winds coming from the hills round Jerusalem overcame the feeble resistance of their constitutions weakened by sickness, they died in thousands.

During the Great War, the British Army also had the sad experience of the dangers arising from malaria mosquitoes in the Jordan valley. In that place, where, centuries ago, the malaria mosquito ravaged the Assyrian army, a successful campaign is being carried on against these dangerous insects. All those taking part in the fight against malaria are backed up by the recommendation given by the Malaria Commission of the League of Nations, prescribing the taking as a preventive measure during the fever season of six grains of quinine daily and to cure the malady itself a dose of 15 grains to 20 grains of quinine per day during five to seven days. On page 124 of its report, issued in 1938, this Malaria Commission stresses the fact that the harmlessness of quinine makes it a suitable drug for administration by subordinate personnel without constant medical supervision, whereas such supervision is essential in the case of synthetic products.

We may give free course to our imagination and ask ourselves what change might have taken place in history if only Sennacherib had been able to subject the Assyrian army to a systematic quinine treatment, so as to have laid low his most formidable adversary, the malaria mosquito.



The motorship "Oranje," largest and fastest Diesel-engined passenger liner in the world, equipped with Sulzer Diesel engines totalling 46,500 b.h.p.

Engineering Notes

INDUSTRIAL

NEW CANAL PROJECT.—A major canal project linking the industrial city of Mukden and the operations at Anshan and Fushun with the seaport of Yingkow is under consideration.

Separate proposals have emanated from the Department of Communications and the Department of Industry, with the prospect that their proposals will be consolidated, giving probability to the project. The scheme is to utilize the Liao river and smaller streams.

BEANS via SIBERIA.—The Government of Manchoukuo recently started formal negotiations with the Russian Government as regards transportation of Manchurian soya beans via Siberia and Russia to Germany, Japanese papers reveal.

Attempts to resume Manchurian soya bean exports via Siberia to Germany without special arrangements with the Moscow Government failed to produce any result, the Tokyo press discloses.

Freight rates on the Trans-Siberia Railway are quite uncertain, and also the allotment of freight cars is indefinite, according to the Japanese press.

GREATER TIENTSIN.—The Hopei provincial administration, the Tientsin municipality and the Reconstruction Administration of the "Provisional Government" have jointly issued an order to the effect that as the three organizations have fixed plans for the reconstruction of Greater Tientsin, all land and houses within the designated areas for reconstruction are forbidden to be sold, state Chinese reports.

The order fixes the areas in which such sales are forbidden unless with the special permission of the Tientsin Engineering Bureau of the Reconstruction Administration.

JAPANESE CITIES MERGE.—The largest Japanese city and the most important Nipponese port west of Kobe is to be formed by a merger of three Japanese cities, Shimonoseki (on the Main Island), Moji and Kokura (the latter two on Kyushu). The Tokyo Cabinet's Planning Board has worked out a scheme for the unification of these three cities in connection with a tunnel under the Shimonoseki Straits, connecting the Main Island of Japan with Kyushu.

The new merged city will have a population of at least 500,000 souls, and later is to be amalgamated with three other industrial cities in North Kyushu, viz., Yawata, Tobata and Wakamatsu.

COMMUNICATIONS

KAIFENG RADIO STATION.—The Japan Radio Broadcasting Corporation has decided to establish a powerful broadcasting station in Kaifeng, the capital of Honan province, it is reported.

Engineers are already working on the plan, and the proposed broadcasting station is expected to be completed soon.

TELEVISION IN TOKYO.—With the installment in Tokyo of four units of image-arresting equipment, the public will soon be provided with another air entertainment in the form of television by the Television Receiving Station which will be housed in the Atagoyama building where the Japan Broadcasting Station formerly had its studio. All preparations are ready now to begin the Station's business when permission is given by the Ministry of Communications.

JAPAN-BULGARIA PHONE.—The Communications Office opened international radiophone service between Japan and Bulgaria on Wednesday, October 25. The decision was reached in view of the increasing tension in the Balkan states.

Service will be relayed at Berlin. The charge will be Y92 for the first three minutes. On Saturdays the reduced rate of Y52, which is charged for conversations with other European countries, will be allowed.

SERVICE SPEEDED UP.—Wireless communication service between Shanghai and Nanking will be speeded up by the Central China Tele-communications Company, according to the *Shanghai Mainichi*.

New equipment installed in both cities will enable the company to handle three times as many messages as at present. Business of the company was expected to expand along with the progress of reconstruction enterprises in Central China, the paper said.

ROAD WORK HALTED.—With a shortage of materials, consequent upon the outbreak of war in Europe, work in the Yunnan-Burma Railway has come to a standstill, authoritative Chinese reports from Chungking say.

The seasonal prevalence of epidemics in Yunnan in the autumn, coupled with the opposition to the railway by inhabitants of the Burma borber areas, who fear an influx of Chinese immigrants from Yunnan when the line is completed, were also cited as contributory causes to the virtual stoppage of work on the project.

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